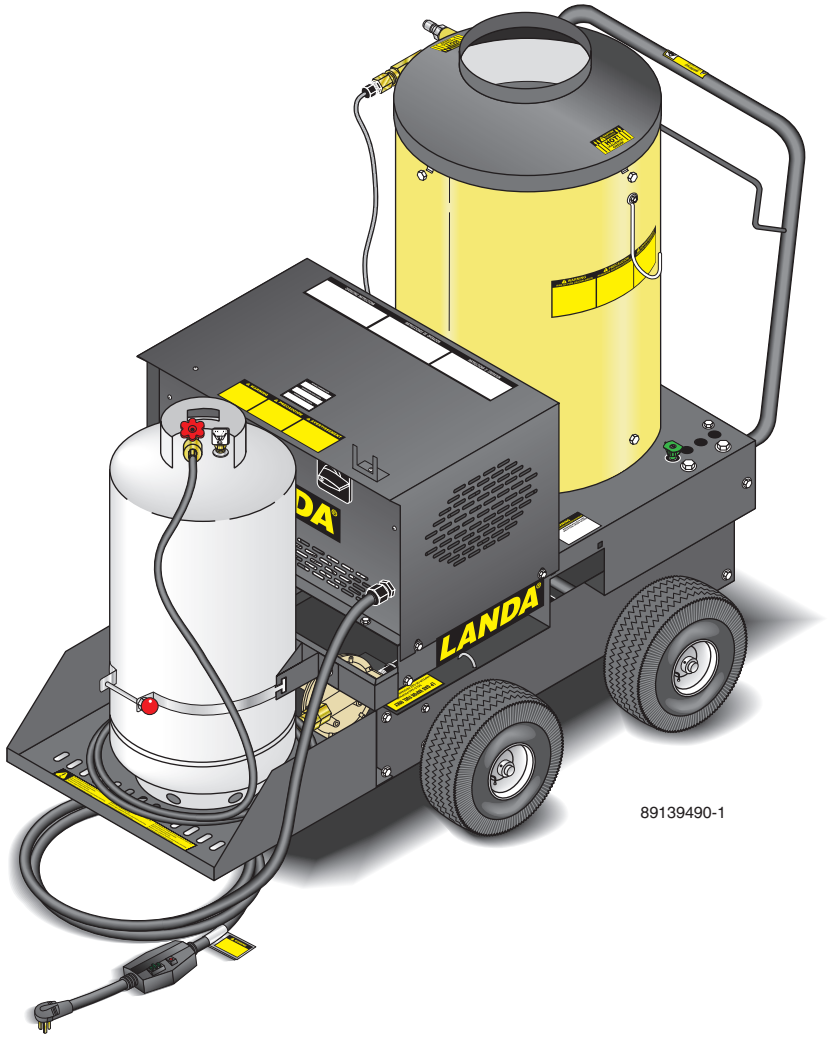
# LANDA® VHP

# OPERATOR'S MANUAL

■ **VHP2-1500** (1.109-556.0) ■ **VHP3-2000** (1.109-557.0)

**USE VAPOR FUEL ONLY**




For technical assistance or the Landa Dealer nearest you,
consult our web page at **www.landa.com**

8.913-949.0

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Model Number _____

Serial Number _____

Date of Purchase _____

The model and serial numbers will be found on a decal attached to the pressure washer. You should record both serial number and date of purchase and keep in a safe place for future reference.

# INTRODUCTION & IMPORTANT SAFETY INFORMATION

Thank you for purchasing this Pressure Washer.

We reserve the right to make changes at any time without incurring any obligation.

## Owner/User Responsibility:

The owner and/or user must have an understanding of the manufacturer's operating instructions and warnings before using this pressure washer. Warning information should be emphasized and understood. If the operator is not fluent in English, the manufacturer's instructions and warnings shall be read to and discussed with the operator in the operator's native language by the purchaser/owner, making sure that the operator comprehends its contents.

Owner and/or user must study and maintain for future reference the manufacturers' instructions.

The operator must know how to stop the machine quickly and understand the operation of all controls. Never permit anyone to operate the engine without proper instructions.

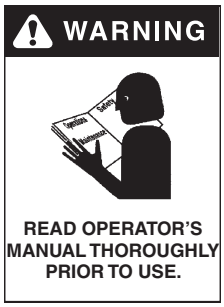
**SAVE THESE INSTRUCTIONS**

**This manual should be considered a permanent part of the machine and should remain with it if machine is resold.**

**When ordering parts, please specify model and serial number. Use only identical replacement parts.**

**This machine is to be used only by trained operators.**

# IMPORTANT SAFETY INFORMATION




***WARNING: To reduce the risk of injury, read operating instructions carefully before using.***

1. Read the owner's manual thoroughly. Failure to follow instructions could cause malfunction of the machine and result in death, serious bodily injury and/or property damage.
2. Know how to stop the machine and bleed pressure quickly. Be thoroughly familiar with the controls.
3. Stay alert — watch what you are doing.
4. Do not replace LP tank while machine is running.
5. All installations must comply with local codes. Contact your electrician, plumber, utility company or the selling distributor for specific details. If your machine is rated 250 volts or less, single phase will be provided with a ground fault circuit interrupter (GFCI). If rated more than 250 volts, or more than single phase this product should only be connected to a power supply receptacle protected by a GFCI.

***DANGER: Improper connection of the equipment-grounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personnel if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the product - if it will not fit the outlet, have a proper outlet installed by a qualified electrician. Do not use any type of adaptor with this product.***

***WARNING: Keep wand, hose, and water spray away from electric wiring or fatal electric shock may result.***

6. To protect the operator from electrical shock, the machine must be electrically grounded. It is the responsibility of the owner to connect this machine to a UL grounded receptacle of proper voltage and amperage ratings. Do not spray water on or near electrical components. Do not touch machine with wet hands or while standing in water. Always disconnect power before servicing.

***WARNING: Flammable liquids can create fumes which can ignite, causing property damage or severe injury.***

***WARNING: Risk of explosion — Operate only where open flame or torch is permitted.***

***WARNING: Risk of fire — Do not change tanks when the product is operating or still hot.***

***WARNING: Use vapor fuel only.***

7. Oil burning appliances shall be installed only in locations where combustible dusts and flammable gases or vapors are not present. Do not store or use gasoline near this machine.
8. Keep operating area clear of all persons.

***WARNING: High pressure spray can cause paint chips or other particles to become airborne and fly at high speeds. To avoid personal injury, eye, hand and foot safety devices must be worn.***

9. Eye, hand, and foot protection must be worn when using this equipment.

# IMPORTANT SAFETY INFORMATION

**WARNING**

EAR PROTECTION MUST BE WORN

***WARNING: This machine exceeds 85 db appropriate ear protection must be worn.***

**CAUTION**

HOT DISCHARGE FLUID: DO NOT TOUCH OR DIRECT DISCHARGE STREAM AT PERSONS.

***CAUTION: Hot discharge fluid. Do not touch or direct discharge stream at persons.***

***WARNING: This machine produces hot water and must have insulated components attached to protect the operator.***

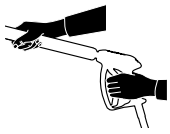
**WARNING**

Risk Of Injury. Hot Surfaces Can Cause Burns

***WARNING: Risk of injury. Hot surfaces can cause burns. Use only designated gripping areas of spray gun and wand. Do not place hands or feet on non-insulated areas of the pressure washer.***

10. To reduce the risk of injury, close supervision is necessary when a machine is used near children. Do not allow children to operate the pressure washer. **This machine must be attended during operation.**

**WARNING**



TRIGGER GUN KICKS BACK - HOLD WITH BOTH HANDS

***WARNING: Grip cleaning wand securely with both hands before starting. Failure to do this could result in injury from a whipping wand.***

11. Never make adjustments on machine while in operation.
12. Be certain all quick coupler fittings are secured before using pressure washer.

**WARNING**

RISK OF INJECTION OR SEVERE INJURY TO PERSONS. KEEP CLEAR OF NOZZLE.

***WARNING: High pressure developed by these machines will cause personal injury or equipment damage. Keep clear of nozzle. Use caution when operating. Do not direct discharge stream at people, or severe injury or death will result.***

**WARNING**

PROTECT FROM FREEZING

***WARNING: Protect machine from freezing.***

13. To keep machine in best operating conditions, it is important you protect machine from freezing. Failure to protect machine from freezing could cause malfunction of the machine and result in death, serious bodily injury, and/or property damage. Follow storage instructions specified in this manual.
14. Inlet water must be clean fresh water and no hotter then 90°F.

**WARNING**

RISK OF ASPHYXIATION. USE THIS PRODUCT ONLY IN A WELL VENTILATED AREA.

***WARNING: Risk of asphyxiation. Use this product only in a well ventilated area.***

15. Avoid installing machines in small areas or near exhaust fans. Adequate oxygen is needed for combustion or dangerous carbon monoxide will result.
16. Manufacturer will not be liable for any changes made to our standard machines or any components not purchased from us.
17. The best insurance against an accident is precaution and knowledge of the machine.

**WARNING**

RISK OF INJURY FROM FALLS WHEN USING LADDER.

***WARNING: Be extremely careful when using a ladder, scaffolding or any other relatively unstable location. The cleaning area should have adequate slopes and drainage to reduce the possibility of a fall due to slippery surfaces.***

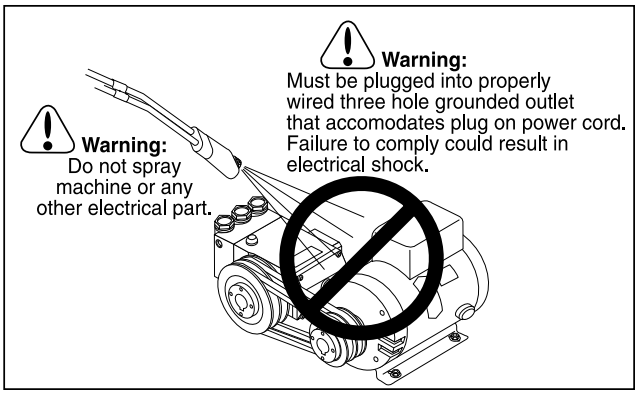
18. Do not overreach or stand on unstable support. Keep good footing and balance at all times.
19. Do not operate this machine when fatigued or under the influence of alcohol, prescription medications, or drugs.
20. Follow the maintenance instructions specified in the manual.
21. Do not replace LP tank while machine is running. Serious injury could result.

***WARNING: Use vapor fuel only.***

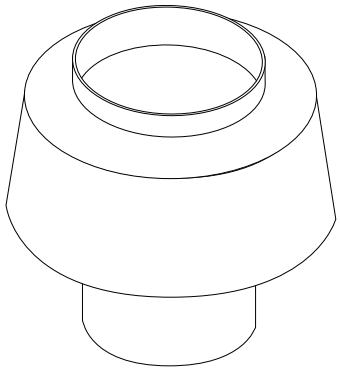
22. The LP models are designed to run on vapor propane fuel. Do not use liquid fuel. Have a qualified serviceman install and service your equipment.

23. Never expose a spark or flame where there may be unburned gas present.
24. Install the machine 18" above the floor and about 2 feet from wall providing adequate ventilation and space.
25. When making repairs disconnect from electrical source and shut off gas valve.
26. Install this machine on non combustible flooring.
27. Do not allow acids, caustic or abrasive fluids to pass through the pump.
28. Never run pump dry or leave spray gun closed longer than 1-2 minutes.

***WARNING: If connection is made to portable water supply, a back flow device must be provided.***

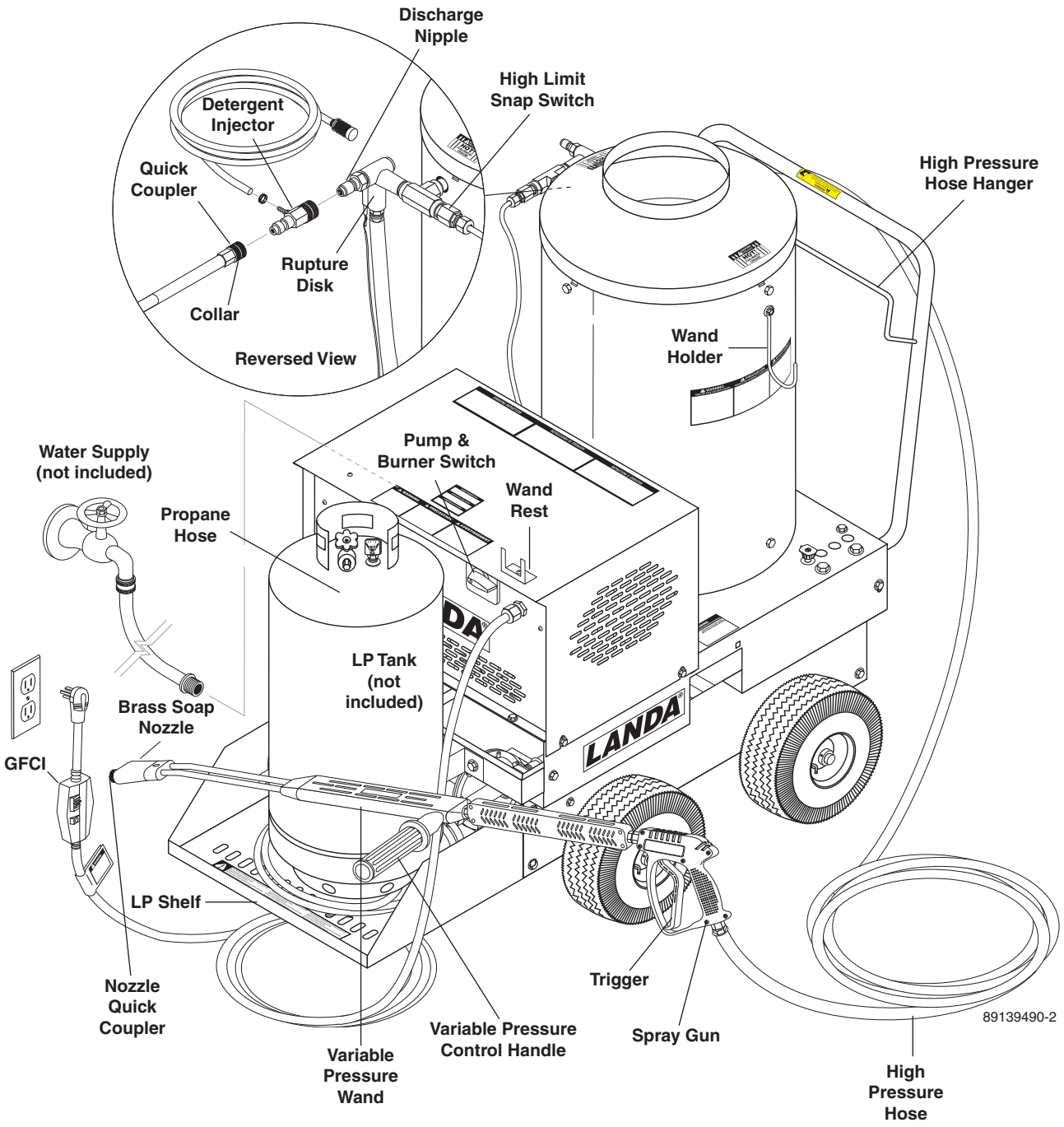

Warning:
Must be plugged into properly wired three hole grounded outlet that accomodates plug on power cord. Failure to comply could result in electrical shock.
Warning:
Do not spray machine or any other electrical part.

Follow the maintenance instructions specified in the manual.



**Example Of Down Draft Diverter For Gas Fired Machines**

# COMPONENT IDENTIFICATION



***WARNING: Moving this machine on an incline may cause instability and could result in the machine tipping over. Equipment damage or bodily harm could occur.***

Place machine in a convenient location providing ample support, drainage and room for maintenance.

**These machines are intended for indoor use. Machine must be stored indoors when not in use.**

## Location:

The location should protect the machine from damaging environmental conditions, such as wind, rain and freezing.

1. The machine should be run on a level surface where it is not readily influenced by outside sources such as strong winds, freezing temperatures, rain, etc. Consider accessibility for the replacing of LP tanks, refilling of detergents, adjustments and maintenance when selecting a location. Normal precautions should be taken by the operator to prevent excess moisture from reaching electrical components.
2. It is recommended that a partition be made between the wash area and the machine to prevent direct spray from the spray gun to come in contact with machine. Excess moisture reaching the electrical controls will reduce the machine life and may cause electrical shorts.
3. During installation, beware of poorly ventilated locations or areas where exhaust fans may cause an insufficient supply of oxygen. Sufficient combustion can only be obtained when there is a sufficient supply of oxygen available for the amount of fuel being burned. If it is necessary to install in a poorly ventilated area, outside fresh air may have to be piped to the burner and a fan installed to bring air into the room. Avoid small locations or areas near exhaust fans.

## Gas Codes:

Confer with local gas company and with proper municipal officials regarding any specific code or regulations governing the installation. The installation must conform to local codes.

The gas pressure coming out of the regulator and going to the burner ring has been factory set for elevations of 0 to 2000 ft. Altitudes greater than 2000 ft will require adjustments to the gas manifold pressures. Consult your local service dealer/distributor for high altitude adjustments. In Canada, certification for installation at altitudes over 4500 feet above sea level is the jurisdiction of local authorities. You should not readjust the burner ring gas pressure. If you replace your gas valve, you will need to adjust the new valve. Refer to your machine's specification plate for the correct pressure setting. Follow the installation and adjustment instructions provided with your replacement valve.

**NOTE**: Air for combustion and ventilation along with exhaust flue sizing must conform to methods outlined in current American Standard (ANSI-Z223.1) National Fuel Gas Code or National Standard of Canada CSA-149.1 and CSA-149.2 "Installation Code for Gas Burning Appliances".

## Electrical:

This machine, when installed, must be electrically grounded in accordance to local codes. Check for proper power supply using a volt meter. The VHP2-15021D requires a 20 amp receptacle to comply with UL 1776 certification standards.

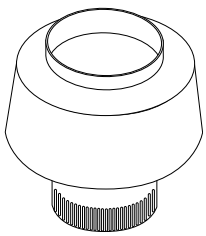
## Venting:

Regulations or ventilation concerns may call for a chimney or furnace pipe.

When venting, if the machine is to be in an enclosed area with a chimney on it, be sure the chimney is the same size as the stack on the machine. Poor draft will cause machine to soot and not operate efficiently. When placing for installation, keep in mind that the pressure washer should be positioned in such a manner that the stack will be as straight as possible and protrude through the roof of the building at a proper location and at sufficient height to eliminate downdraft. The chimney of gas fired machines should be installed with a down draft diverter.

## Draft Diverter:

A draft diverter should be installed above the heating coil. The diverter serves to sever the chimney effect created in all sections of furnace pipe positioned below to enhance the draft through the burner. It also helps prevent freezing of the coil due to wind chill factors. **NOTE:** the draft diverter is not standard on VHP machines.



When the pressure washer is installed in a tightly closed room without ventilation openings to the outdoors or other rooms, provisions shall be made for supplying air for combustion through special openings, one near the floor line and the other near the ceiling, each to be sized on the basis of one square inch or more of free area for each 1,000 BTU input per hour.

# INSTALLATION

## Placement:

Do not locate near any combustible material. Keep all flammable material at least 20 feet away.

Allow enough space for servicing the machine.

Local code will require certain distances from floor and walls. (Two feet away should be adequate.)

## Water Source:

Water source for machine should be supplied by a 5/8" I.D. garden hose with a city water pressure of not less than 30 psi. If the water supply is inadequate, or if the garden hose is kinked, the machine will run very rough and the burner will not fire.

## Connection:

Connect the wand, nozzle, hose and spray gun (where applicable). On pipe thread connections, use teflon tape to avoid water leaks. (See Component Identification.)

Attach high pressure hose to discharge nipple by pulling the quick coupler collar back and inserting it onto the discharge nipple. Then push the collar forward to secure. A detergent injector could be inserted between the hose coupler and the discharge nipple. (See page 10.)

Place detergent dip tube into liquid soap or detergent solution. Avoid letting tube suck air.

***CAUTION: When installing propane hose to LP tank, please note that it has left hand threads.***

## Inspection and Testing:

Before turning gas under pressure into piping, all openings from which gas can escape should be closed. Immediately after turning on gas, the system should be checked for leaks. This can be done by watching the 1/2 cubic foot test dial and allowing 5 minutes to show any movement, or by soaping each pipe connection and watching for bubbles. If a leak is found, make the necessary repairs and repeat the above test.

Defective pipes or fittings should be replaced and not repaired. Never use a flame or fire in any form to locate gas leaks, use a soap solution.

After the piping and meter have been checked completely, purge the system of air. **DO NOT** bleed the air inside an enclosed room.

The pressure washer and its individual shut-off valve must be disconnected from the gas supply piping system during the pressure testing of that system at test pressure in excess of 1/2 psig or damage to the gas valve will occur.

## Shut-Off Valve:

A gas shut-off valve has been installed between the gas supply line and the washer. The plumbing also includes a union between the shut-off valve and the burner.

## Condensation from Coils:

When cold water is being pumped into the water heater coils, and the burners are on, condensation will form on the coils and drip down into the burner compartment giving the appearance of a leaking coil, particularly on cold humid days.

## Check Water Heater Coil for Leaks:

With the burner "OFF" start the pumping machine and allow to run for a few minutes. Look into the burner compartment with a drop light or flashlight. If no leak is visible, then subsequent water dripping from the coil will be from condensation in the flue gases when the burner is on, as described in the previous paragraph.

| PRE-START CHECK LIST | YES | NO |
|---|---|---|
| Is machine protected from down-draft and excessive wind? | | |
| Is machine shielded from moisture or water spray? | | |
| Is the voltage correct and circuit breaker and supply cord adequate according to specifications and serial plate notation? | | |
| Is the machine electrically grounded? | | |
| Is there ample water supply? | | |
| Have all flammable liquids or gases been removed from installation location? | | |
| Is the machine properly vented to allow adequate air flow? | | |
| Is there an adequate gas supply for the BTU rating of the burner? | | |
| Have gas lines been checked for gas leaks? | | |
| Have all operators using this machine been instructed properly & have they read the manual? | | |
| Has the machine been installed according to the instructions in the operator's manual? | | |
| Is the incoming gas supply pressure to the machine between 6-14 water column inches or 1/2 psig? | | |

# INSTRUCTIONS FOR LIGHTING

***WARNING: If "NO" has been checked on any of the above questions, do not operate.***

**⚠ WARNING**

**RISK OF FIRE OR EXPLOSION: FOLLOW INSTRUCTIONS EXACTLY.**

***WARNING: If you do not follow instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.***

1. This machine has a pilot which must be lighted by hand. When lighting the pilot, follow these instructions exactly.
2. **BEFORE LIGHTING** smell all around the appliance area for gas. Be sure to smell next to the floor because propane gas is heavier than air and will settle on the floor.

   **For your safety:**

   **"WHAT TO DO IF YOU SMELL GAS"**

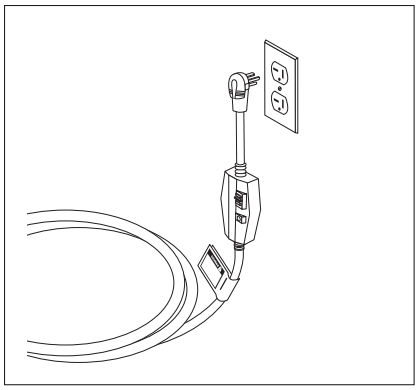
   **a. Do not try to light any appliance.**

   **b. Do not touch any electrical switch; do not use any phone in your building.**

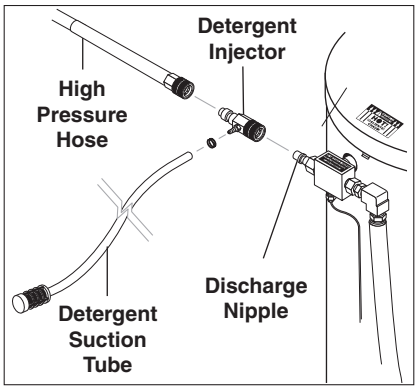
   **c. Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**

   **d. If you cannot reach your gas supplier, call the fire department.**
3. Use only your hand to push in or turn gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
4. Do not use this machine if any part has been under water. Immediately call a qualified service technician to inspect the machine and to replace any part of the control system or any gas control that has been under water.

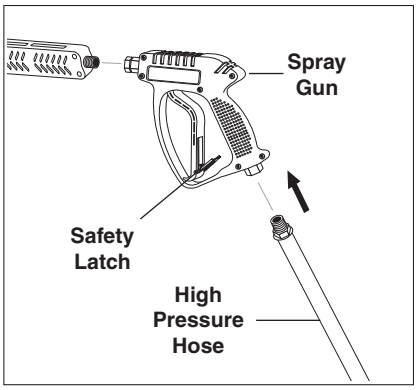
# ASSEMBLY INSTRUCTIONS



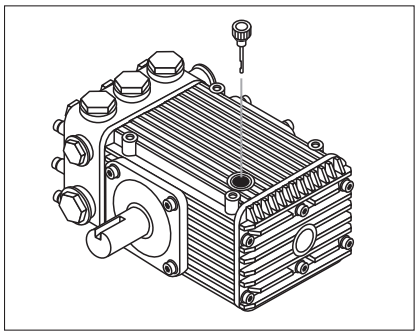
**STEP 1:** Connect power cord to proper electrical outlet according to serial plate information. Push in GFCI reset button. The VHP2-15021D requires a 20 amp receptacle.



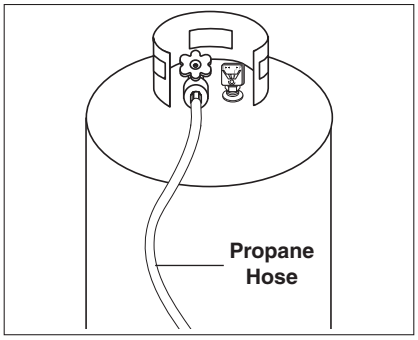

**STEP 2:** Connect high pressure hose to discharge nipple by sliding quick coupler collar back. (If detergent is to be applied, insert a detergent injector.) Insert quick coupler onto discharge nipple and secure by pushing quick coupler collar forward.




**STEP 3:** Attach the high pressure hose to the spray gun using teflon tape on hose threads. Move safety latch into locked position.

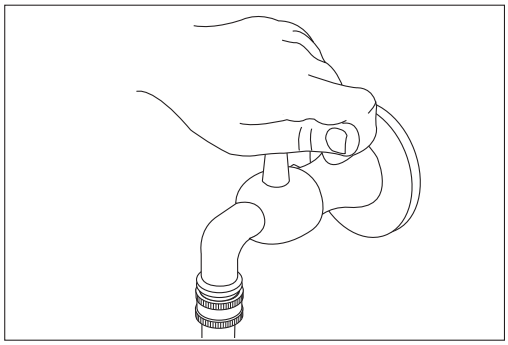


**STEP 4:** Check oil level by using supplied dip-stick. Use SAE 30W non-detergent only.

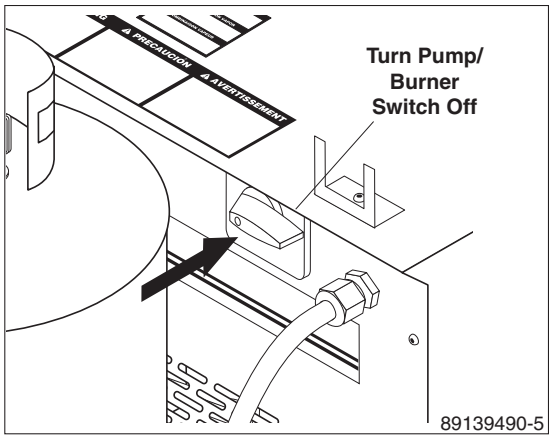



**STEP 5:** Connect propane hose to a propane tank.

# OPERATING INSTRUCTIONS

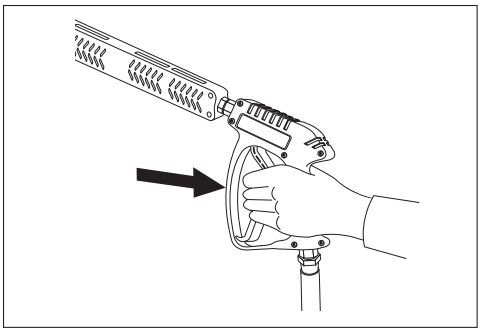


**STEP 1: STOP!** Read operator's manual before operating this machine. Failure to read operation and warning instructions may result in personal injury or property damage. Connect water supply hose to inlet connector and turn water on.



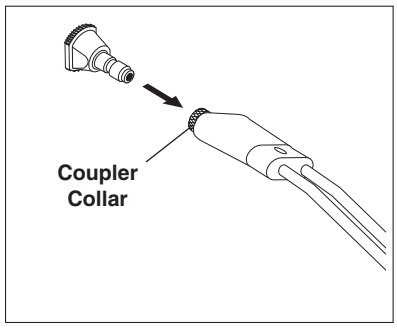

**STEP 2:** Turn all switches off. Remove and position LP tank as far from machine as supply hose will allow.

# OPERATING INSTRUCTIONS

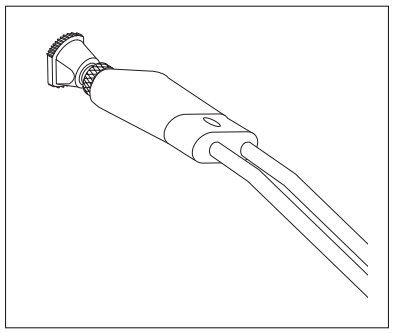


**STEP 3:** Before installing nozzle, Pull trigger on spray gun allowing water to flow until all air has been discharged from the system. Check for water leaks and tighten as needed.

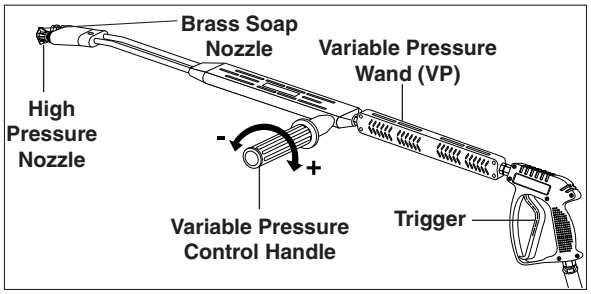
Grip spray gun variable pressure wand securely. Then turn the variable pressure control handle counterclockwise to flush any debris out of soap nozzle.



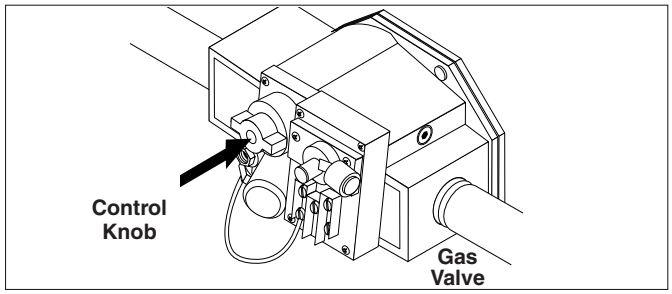

**STEP 4:** Pull the spring-loaded collar of the wand coupler collar back to insert your choice of pressure nozzle. ***CAUTION: Never replace nozzles without engaging the safety latch on the spray gun trigger.***



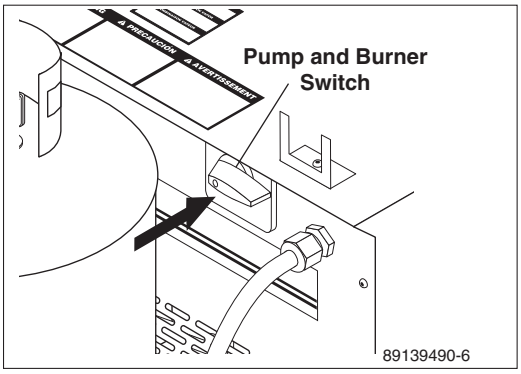
**STEP 5:** Release the coupler collar and push the nozzle until the collar clicks. Pull the nozzle to make sure it is seated properly.




**STEP 6:** Selection of high or low pressure is accompanied by turning the handle. **Note:** High pressure nozzle must be inserted at end of wand to obtain high pressure. To apply soap read operator's manual.

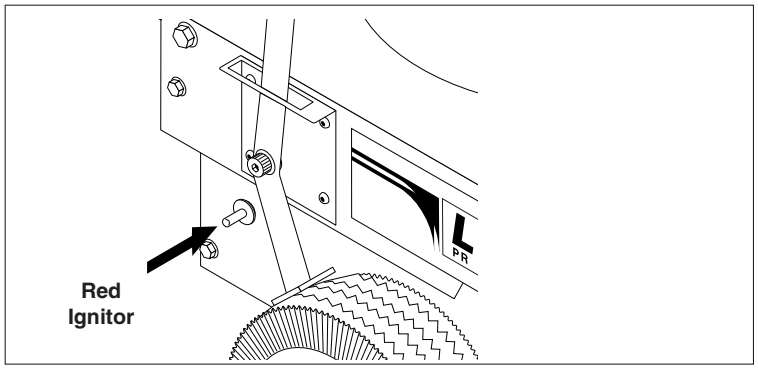



**STEP 7:** Open valve on LP tank, then slightly depress main gas valve control knob on the right side of the machine and turn it counterclockwise to the Pilot position. **NOTE:** Knob cannot be turned from "Pilot" to "OFF" unless the knob is slightly depressed.




**STEP 9:** Turn switch to pump position and pull the trigger on the spray gun. Turn variable pressure control wand handle clockwise to obtain pressure for cold water operation.

For hot water, turn the switch to the burner position and pull the trigger on the spray gun. To apply detergent, read section on Detergents and General Cleaning Techniques.



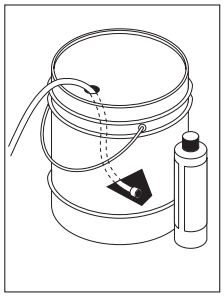

**Step 8:** Depress the control knob all the way and hold it in. After five (5) seconds, depress the red ignitor until you hear a loud click. Repeat 3 or 4 times if necessary until pilot is lit. If pilot does not remain lit, repeat operation allowing a longer period of time before releasing the gas valve knob. After the pilot lights, continue to hold the control knob down for about one (1) minute before releasing. Look at the pilot viewing mirror at the rear of the machine.

Turn gas control knob counterclockwise to "ON."

# DETERGENTS & GENERAL CLEANING TECHNIQUES

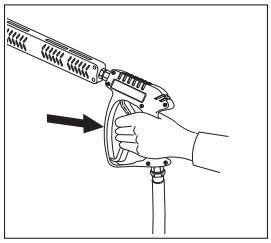
**⚠ WARNING**

***WARNING: Some detergents may be harmful if inhaled or ingested, causing severe nausea, fainting or poisoning. The harmful elements may cause property damage or severe injury.***



**STEP 1:** Use detergent designed specifically for pressure washers. Household detergents could damage the pump. Prepare detergent solution as required by the manufacturer. Fill a container with pressure washer detergent. Place the filter end of detergent suction tube into the detergent container.

**STEP 2:** Apply safety latch to spray gun trigger. Secure black detergent nozzle into quick coupler. **NOTE:** Detergent cannot be applied using the yellow nozzle.



**STEP 3:** With the motor running, pull trigger to operate machine. Liquid detergent is drawn into the machine and mixed with water at an approximate ratio of 15 to 1. Turn pressure control handle on wand counterclockwise. This lowers the pressure by directing the water flow through the soap nozzle and allow detergent injector to siphon soap.

Apply detergent to work area. Do not allow detergent to dry on surface.

***IMPORTANT: You must flush the detergent injection system after each use by placing the suction tube into a bucket of clean water, then run the pressure washer in low pressure for 1-2 minutes.***

# CLEANING TIPS

Pre-rinse cleaning surface with fresh water. Place detergent suction tube directly into cleaning solution and apply to surface at low pressure (for best results, limit your work area to sections approximately 6 feet square and always apply detergent from bottom to top). Allow detergent to remain on surface 1-3 minutes. Do not allow detergent to dry on surface. If surface appears to be drying, simply wet down surface with fresh water. If needed, use brush to remove stubborn dirt. Rinse at high pressure from top to bottom in an even sweeping motion keeping the spray nozzle approximately 1 foot from cleaning surface. Use overlapping strokes as you clean and rinse any surface. For best surface cleaning action, spray at a slight angle.

## Recommendations:

- Before cleaning any surface, an inconspicuous area should be cleaned to test spray pattern and distance for maximum cleaning results.
- If painted surfaces are peeling or chipping, use extreme caution as pressure washer may remove the loose paint from the surface.
- Keep the spray nozzle a safe distance from the surface you plan to clean. High pressure wash a small area, then check the surface for damage. If no damage is found, continue to pressure washing.

***⚠ CAUTION - Never use:***

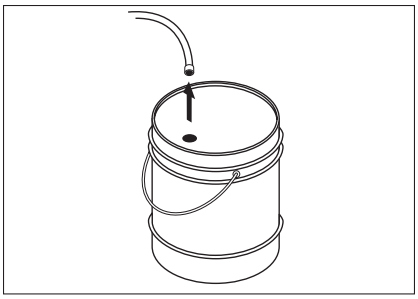
- Bleach, chlorine products and other corrosive chemicals
- Liquids containing solvents (i.e., paint thinner, gasoline, oils)
- Tri-sodium phosphate products
- Ammonia products
- Acid-based products

These chemicals will harm the machine and will damage the surface being cleaned.

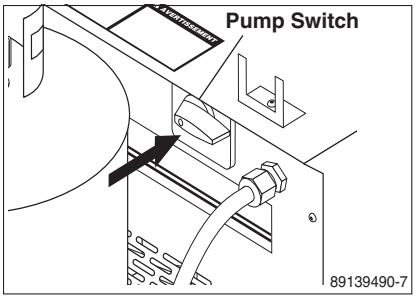
# RINSING

It will take a few seconds for the detergent to clear. Apply safety latch to spray gun. Remove black soap nozzle from the quick coupler. Select and install the desired high pressure nozzle. **NOTE:** You can also stop detergent from flowing by simply removing detergent siphon tube from bottle.

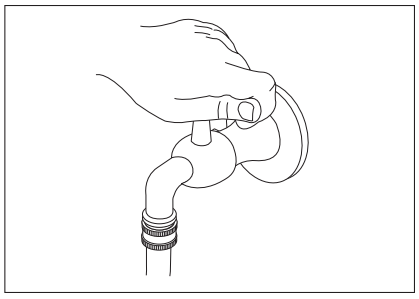
# SHUTTING DOWN AND CLEAN-UP



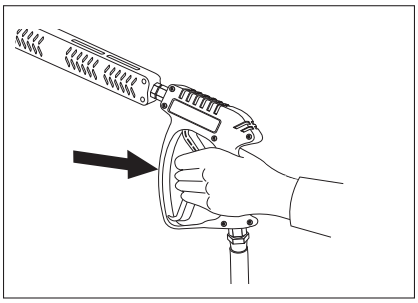
**STEP 1:** Remove detergent suction tube from container and insert into one (1) gallon of fresh water. Flush detergent lines with fresh water, switch to the pump position and continue to spray water allowing burner to cool.




**STEP 2:** After water has cooled, turn pump off. Turn main gas valve off, then close the valve on the LP tank. Secure the LP tank to the machine when moving it.



**STEP 3:** Turn the water off. To protect from freezing, pull the trigger on spray gun to allow water to drain from the system.



**STEP 4:** Squeeze trigger on spray gun to relieve remaining pressure. Move safety latch into its locked position.

# STORAGE

***CAUTION: Always store your pressure washer in a location where the temperature will not fall below 32°F (0°C). The pump in this machine is susceptible to permanent damage if frozen. FREEZE DAMAGE IS NOT COVERED BY WARRANTY.***

1. Stop the pressure washer, squeeze spray gun trigger to release pressure.
2. Detach water supply hose and high pressure hose.
3. Turn on the machine for a few seconds, until remaining water exits. Turn engine off immediately.
4. Drain the gas and oil from the engine.
5. Do not allow high pressure hose to become kinked.
6. Store the machine and accessories in a room which does not reach freezing temperatures.

***CAUTION: Failure to follow the above directions will result in damage to your pressure washer.***

When the pressure washer is not being operated or is being stored for more than one month, follow these instructions:

1. Replenish engine oil to upper level.
2. Drain gasoline from fuel tank, fuel line, fuel valve and carburetor.
3. Pour about one teaspoon of engine oil through the spark plug hole, pull the starter grip several times and replace the plug. Then pull the starter grip slowly until you feel increased pressure which indicates the piston is on its compression stroke and leave it in that position. This closes both the intake and exhaust valves to prevent rusting of cylinder.
4. Cover the pressure washer and store in a clean, dry place that is well ventilated away from open flame or sparks. **NOTE:** The use of a fuel additive, such as STA-BIL®, or an equivalent, will minimize the formulation of fuel deposits during shortage. Such additives may be added to the gasoline in the fuel tank of the engine, or to the gasoline in a storage container.

## After Extended Storage

***CAUTION: Prior to restarting, thaw out any possible ice from pressure washer hoses, spray gun or wand.***

## Engine Maintenance

During the winter months, rare atmospheric conditions may develop which will cause an icing condition in the carburetor. If this develops, the engine may run rough, lose power and may stall. This temporary condition can be overcome by deflecting some of the hot air from the engine over the carburetor area. **NOTE:** Refer to the engine manufacturer's manual for service and maintenance of the engine.

# TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| **PULSATION** | Faulty pulsation damper | Check precharge. If low, recharge or install new one. |
| **LOW PRESSURE** | Worn nozzle | Replace with nozzle of proper size. |
| | Belt slippage | Tighten or replace with correct belt. |
| | Air leak in inlet plumbing | Disassemble, reseal and reassemble. |
| | Relief valve stuck, partially plugged or improperly adjusted. Valve seat worn | Clean and adjust relief valve; check for worn or dirty valve seats. Kit available. |
| | Inlet suction strainer clogged or improperly sized | Clean. Use adequate size. Check more frequently. |
| | Worn packing.<br>Abrasives in pumped in cavitation.<br>Inadequate water | Install proper filter. Suction at inlet manifold must be limited to lifting less than 20 feet of water or 8.5 psi vacuum. |
| | Fouled or dirty inlet or discharge valves | Clean inlet and discharge valve assemblies. |
| | Worn inlet, discharge valve blocked or dirty | Replace worn valves, valve seats and/or discharge hose. |
| | Leaky discharge hose | Replace. |
| **PUMP RUNS EXTREMELY ROUGH, PRESSURE VERY LOW** | Restricted inlet or air entering the inlet plumbing | Proper size inlet plumbing; check for air tight seal. |
| | Inlet restrictions and/or air leaks. Stuck inlet or discharge valve | Replace worn cup or cups. Clean out foreign material. Replace worn valves. |
| **WATER LEAKAGE FROM UNDER MANIFOLD.** | Worn packing | Install new packing. |
| **OIL LEAKING IN AREA OF CRANKSHAFT** | Worn crankshaft seal or improperly installed oil seal O-ring | Remove oil seal retainer and replace damaged O-ring and/or seals. |
| | Bad bearing | Replace bearing. |
| **EXCESSIVE PLAY IN END OF CRANKSHAFT PULLEY** | Worn main bearing from excessive tension on drive belt | Replace crankcase bearing and/or tension drive belt. |
| **WATER IN CRANKCASE** | Humid air condensing into water inside crankcase | Change oil intervals. Use any high grade automotive 30 weight non-detergent oil. |
| | Worn packing and/or piston rod sleeve; O-rings on plunger retainer worn | Replace packing. Replace O-rings. |
| **OIL LEAKING FROM UNDERSIDE OF CRANKCASE** | Worn crankcase piston rod seals | Replace seals. |
| **OIL LEAKING AT REAR PORTION OF CRANKCASE** | Worn crankcase piston rod seals | Replace seals. |
| **LOUD KNOCKING** | Pulley loose on crankshaft | Check key and tighten set screw. |
| **NOISE IN PUMP** | Broken or worn bearing | Replace bearing. |

# TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| **PUMP NOISY** | Air in suction line | Check water supply and connections on suction line. |
| | Broken or weak inlet or discharge valve springs | Check and replace if necessary. |
| | Excessive matter in valves | Check and clean if necessary. |
| | Worn bearings | Check and replace if necessary. |
| **PRESENCE OF WATER IN OIL** | Oil seal worn | Check and replace if necessary. |
| | High humidity in air | Check and change oil twice as often. |
| **WATER DRIPPING FROM UNDER PUMP** | Piston packing worn | Check and replace if necessary. |
| | O-ring plunger retainer worn | Check and replace if necessary. |
| | Pump protector | Check inlet water pressure. |
| **OIL DRIPPING** | Oil seal worn | Check and replace if necessary. |
| **EXCESSIVE VIBRATION IN DELIVERY LINE** | Irregular functioning of the valves | Check and replace if necessary. |
| **RELIEF VALVE LEAKS WATER** | Wrong nozzle size, debris in nozzle | Clean or replace with correct nozzle. |
| **BURNER WILL NOT LIGHT** | No fuel | Open gas valve. |
| | Pilot light is out | Light pilot. |
| | Defective high limit switch | Replace switch. |
| **BURNER SMOKES** | Stack restriction | See venting under installation (page 7). |
| **PILOT DOES NOT LIGHT** | Manual pilot valve closed | Open pilot valve. |
| | Gas leak in pilot | Call qualified serviceman. |
| | Piezo ignitor | Adjust spark gap. Secure wires. |
| **PILOT IGNITES BUT WILL NOT STAY ON WHEN GAS COCK DIAL IS RELEASED** | Pilot too far away from thermocouple | Adjust thermocouple closer to flame. |
| | Thermocouple loose at regulator safety valve | Tighten to firm fit. |
| **SHORT THERMOCOUPLE LIFE** | Excessive heat from pilot light | Decrease pilot supply gas. |
| | Thermocouple too close to pilot | Adjust thermocouple farther away. |
| **BURNER CYCLING ON/OFF** | Defective high limit switch | Replace switch. |
| **WASHER WILL NOT STEAM** | Steam valve closed | Open valve (counterclockwise). |
| | Burner not on | Turn burner switch to "ON" position. |
| | Coil dirty or sooty | See coil maintenance section. |
| | Steam valve clogged | Clean or replace. |

# MAINTENANCE & SERVICE

## PREVENTATIVE MAINTENANCE

1. Check to see that the water pump is properly lubricated.
2. Follow winterizing instructions to prevent freeze damage to the pump and coils.
3. Always neutralize and flush detergent from system after use.
4. If water is known to be high in mineral content, use a water softener in your water system or de-scale as needed.
5. Do not allow acidic, caustic or abrasive fluids to be pumped through system.
6. Always use high grade quality Landa cleaning products.
7. Never run pump dry for extended periods of time.
8. Periodically delime coils as per instructions.

It is advisable, periodically, to visually inspect the burner. Check air inlet to make sure it is not clogged or blocked. Wipe off any oil spills and keep this equipment clean and dry.

The areas around the Landa washer should be kept clean and free of combustible materials, gasoline and other flammable vapors and liquids.

The flow of combustion and ventilating air to the burner must not be blocked or obstructed in any manner.

## MAINTENANCE AND SERVICE

### Unloader Valves:

Unloader valves relieve pressure in the line when the shut-off spray gun is closed. Unloader valves are preset and tested at the factory before shipping. Occasional adjustment of the unloader may be necessary to maintain correct pressure. (Contact your local dealer for correct procedure in adjusting unloader valve.) Tampering with the factory setting may cause personal injury and/or property damage, and will void the manufacturer's warranty.

### Winterizing Procedure:

Damage due to freezing is not covered by warranty. Adhere to the following cold weather procedures whenever the washer must be stored or operated outdoors under freezing conditions.

During winter months, when temperatures drop below 32°F, protecting your machine against freezing is necessary. Store the machine in a heated room. If this is not possible then mix a 50/50 solution of anti-freeze/water into a 5 gallon bucket and with a short section of garden hose elevate the bucket and turn the pump on to siphon the anti-freeze through the machine. If compressed air is available, an air fitting can be screwed into the inlet connector and, by injecting compressed air, all water will be blown out of the system.

### High Limit Hot Water Thermostat:

For safety, each machine is equipped with a high limit control switch. In the event the temperature of the water should exceed its operating temperature, the high limit control will turn the burner off until the water cools.

### Pumps:

Use only SAE 30 weight non-detergent oil. Change oil after first 50 hours of use. Thereafter, change oil every three months or at 500 hour intervals. Oil level should be checked through use of the dipstick found on the top of the pump or by the red dot visible through the oil gauge window. Oil should be maintained at that level.

### Cleaning of Coils:

In alkaline water areas, lime deposits can accumulate rapidly inside the coil pipes. This growth is increased by the extreme heat build up in the coil. The best prevention for liming conditions is to use high quality cleaning detergents. In areas where alkaline water is an extreme problem, periodic use of Landa Deliming Powder (part #9-028008) will remove lime and other deposits before coil becomes plugged. (See Deliming Instructions for use of Landa Deliming Powder.)

### Deliming Coils:

Periodic flushing of coils is recommended.

1. Fill a container with 4 gallons of water, then add 1 lb. of deliming powder. Mix thoroughly.
2. Remove wand assembly from spray gun and put spray gun into container. Secure the trigger on the spray gun into the open position.
3. Attach a short section (3-5 ft.) of garden hose to machine to siphon solution from an elevated container. Turn pump switch on allowing solution to be pumped through coils back into the container. Solution should be allowed to circulate 2-4 hours.
4. After circulating solution, flush entire system with fresh water. Reinstall wand assembly to spray gun.

### Removal of Soot and Heating Coil:

In the heating process, fuel residue in the form of soot deposits may develop between the heating coil pipe and block air flow which will affect burner combustion. When soot has been detected on visual observation, the soot on the coil must be washed off after following the coil removal steps.

# MAINTENANCE & SERVICE

1. Remove the tank head assembly by unscrewing the three Tek screws and lifting the tank head off.
2. Remove the two pipe nipples and associated fittings.
3. Lift the coil out of the outer wrap.

***CAUTION: The coil weighs about 80 lbs. Use proper lifting techniques.***

4. Clean, repair and replace the coil by reversing the above steps.

## Pressure Relief Valve:

Each machine is equipped with a relief valve to relieve pressure in the system when higher than normal operating pressures are encountered. Unusually high pressures come from an object plugging the spray nozzle. This problem can easily be remedied by removing the obstruction. If operating pressure of machine is found to be normal and relief valve continues to leak, repair or replace the valve.

## Rupture Disk

If pressure from pump or thermal expansion should exceed safe limits, the rupture disk will burst, allowing high pressure to be discharged through hose to ground. When disk ruptures, it needs to be replaced.

## Propane Cylinder Capacity:

An important consideration with propane systems is the capacity of the supply cylinder relative to the needs of the burner. The burner operates on propane as a gas; as gas is used from the propane cylinder, the liquid in the cylinder boils to maintain gas pressure. This boiling process cools the liquid, and in a heavy, continuous-demand situation, the liquid temperature can fall to the point at which it cannot provide gas as rapidly as is needed. In this case, it may be necessary to warm the propane cylinder by directing a warm spray, not over 120° F, on the cold cylinder or by manifolding two propane bottles together to increase total vaporization capacity. It is recommended that a minimum 30 lb. vapor propane bottle be used on the machine.

# OIL CHANGE RECORD

| DATE OIL CHANGED MONTH/DAY/YEAR | NO. OF OPERATING HOURS SINCE LAST OIL CHANGE |
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| DATE OIL CHANGED MONTH/DAY/YEAR | NO. OF OPERATING HOURS SINCE LAST OIL CHANGE |
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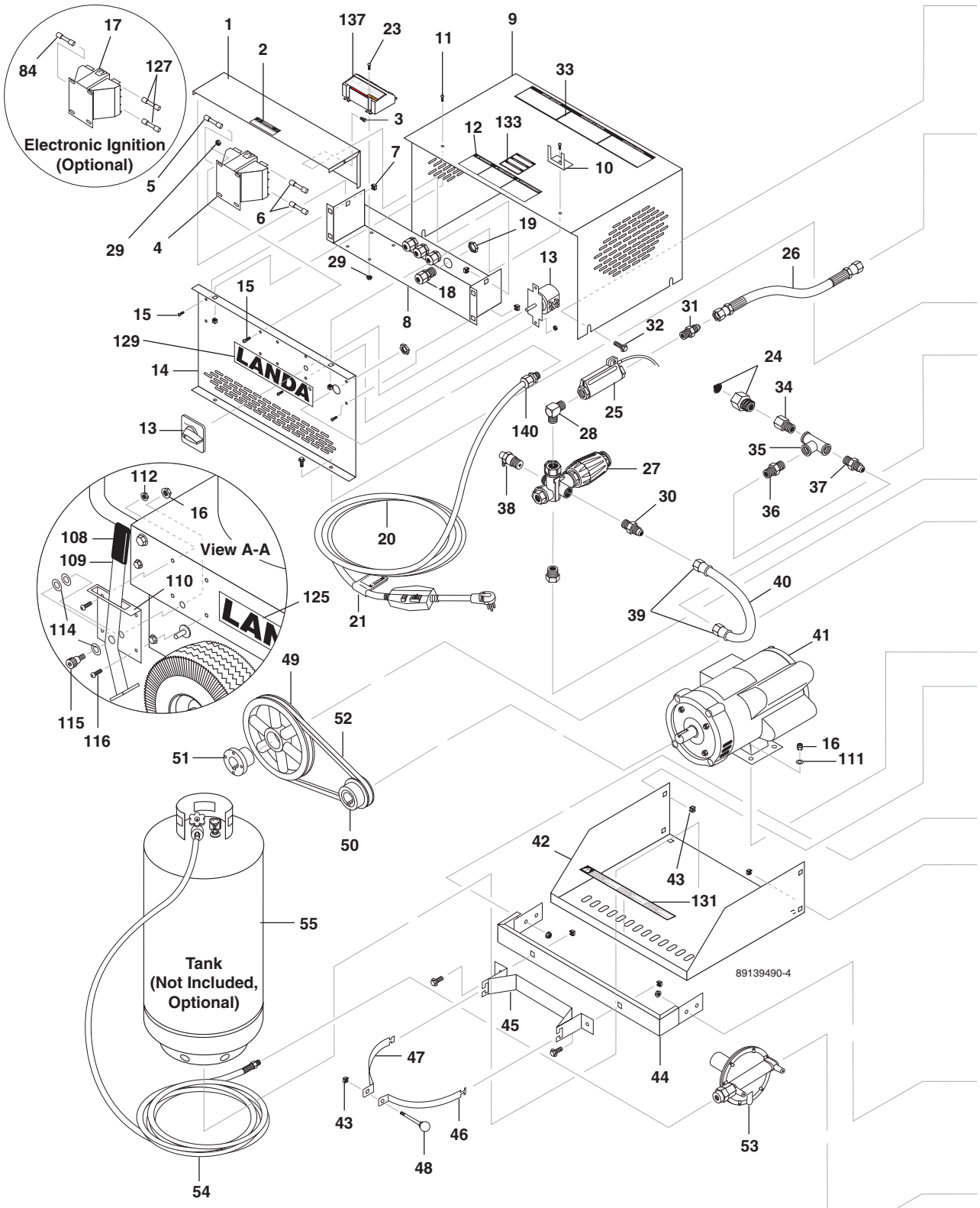
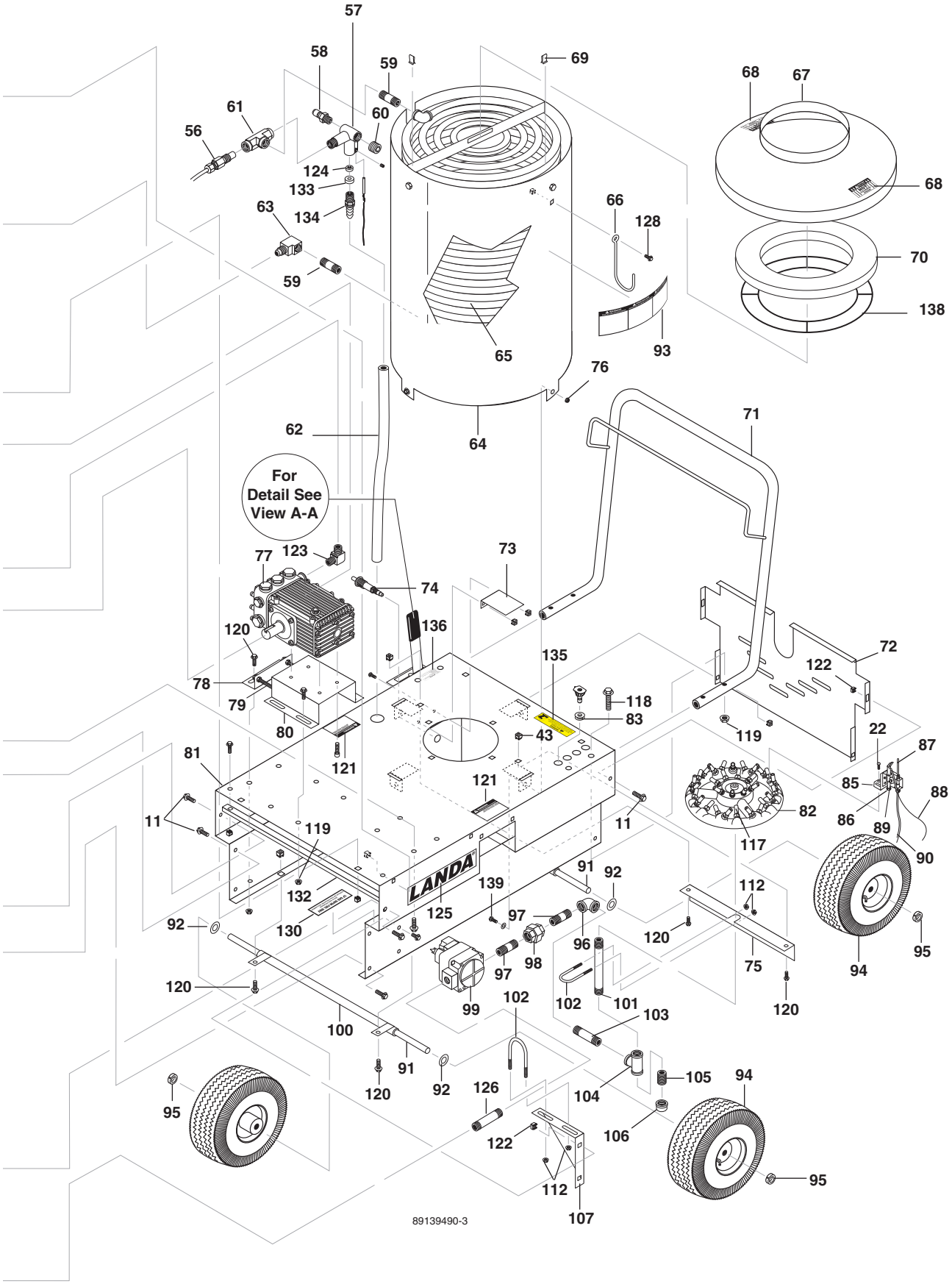
# EXPLODED VIEW — LEFT SIDE



# EXPLODED VIEW — RIGHT SIDE



# EXPLODED VIEW PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 8.912-918.0 | Cover, Electrical Box | 1 |
| 2 | 9.800-016.0 | Label, Disconnect PWR Supply | 1 |
| 3 | 9.802-764.0 | Screw, 10/32" x 3/4", Hex | 2 |
| 4 | 9.802-551.0 | Transformer 240/480V - 120V (3-2000) | 1 |
| 5 | 8.716-173.0 | Fuse, Paper 1 Amp 250V Midget (3-2000) | 1 |
| 6 | 8.933-007.0 | Fuse, 1 Amp 600V Midget (3-2000) | 2 |
| 7 | 9.802-793.0 | Nut, Cage, 1/4" x 16 GA. | 7 |
| 8 | 8.912-917.0 | Box, Electrical, VHW, Belt | 1 |
| | 9.802-762.0 | ▲ Screw, 10/32" x 1-1/4" | 1 |
| | 9.802-695.0 | ▲ Nut, 10/32" Keps<br>(Electric Ignition) | 6<br>10 |
| | 9.800-040.0 | ▲ Label, Ground | 1 |
| 9 | 8.912-919.0 | Cover, Pump & Motor, VHW Belt | 1 |
| 10 | 8.912-888.0 | Holder, Wand Bracket, VHW/VHP | 1 |
| 11 | 9.802-754.0 | Screw, 1/4" x 1/2", HH NC, Whiz Loc | 16 |
| 12 | 9.800-033.0 | Label, Warning Hot Water | 1 |
| 13 | 9.802-449.0 | Switch, 3 PS, 115V-230V, 1 PH | 1 |
| 14 | 8.912-916.0 | Panel, Control, VHW, Belt | 1 |
| 15 | 9.802-759.0 | Screw, 10/32" x 1/2" BHSOC BLK<br>(Electric Ignition) | 8<br>12 |
| 16 | 9.802-776.0 | Nut, 5/16", ESNA, NC | 5 |
| 17 | 9.802-553.0 | Transformer, 120/240 -24V .050 KVA (Electronic Ignition Option) | 1 |
| 18 | 9.802-514.0 | Strain Relief, 1/2" LQ Tite | 4 |
| 19 | 9.802-525.0 | Locknut, 1/2" | 4 |
| 20 | 9.802-433.0 | Plug, GFCI, 240V, 20 Amp (3-2000) | 1 |
| | 9.802-431.0 | Cord w/GFCI, 120V 20 Amps (2-1500) | 1 |
| 21 | 8.932-969.0 | Label, Warning, Service Cord | 1 |
| 22 | 9.802-772.0 | Screw, 10/32" x 1/4" | 2 |
| 23 | 9.802-771.0 | Screw, 10/32" x 3/4" | 4 |
| 24 | 9.802-146.0 | Swivel, 1/2" MP x 3/4" GHF w/Strainer | 1 |
| 25 | 8.933-006.0 | Switch Flow MV 60, Yellow | 1 |
| 26 | 8.918-210.0 | Hose, 3/8" x 16", 2 Wire, Pressure Loop | 1 |
| 27 | 8.750-299.0 | Unloader, VRT 3, 8 GPM @4500 PSI | 1 |
| 28 | 8.706-168.0 | Elbow, 3/8" Male Pipe | 1 |

| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 29 | 9.802-695.0 | Nut, 10/32" Keps | 8 |
| 30 | 9.802-127.0 | Nipple, 1/2" JIC x 3/8" Pipe | 1 |
| 31 | 9.802-036.0 | Nipple, 1/2" JIC x 3/8" Pipe | 1 |
| 32 | 9.802-767.0 | Screw, 3/8" x 3/4" Whiz Loc | 4 |
| 33 | 8.900-822.0 | Label, VHP Operating Instr. | 1 |
| 34 | 8.706-984.0 | Adapter, 1/2" x 1/2" Pipe | 1 |
| 35 | 8.706-844.0 | Tee 1/2" Female, Pipe | 1 |
| 36 | 8.706-797.0 | Nipple, 1/2" Hex | 1 |
| 37 | 9.802-128.0 | Nipple, 1/2" JIC x 1/2" Pipe | 1 |
| 38 | 8.707-254.0 | Pump Protector, 3/8" PTP | 1 |
| 39 | 9.802-151.0 | Swivel, 1/2" JIC Fem, Push-On | 2 |
| 40 | 4-02110000 | Hose, 1/2" Push-On | 12" |
| 41 | 9.802-339.0 | Motor, 2 HP, 1 PH 3450 RPM, C-Face (2-1500) | 1 |
| | 9.802-341.0 | Motor, 5 HP 1 PH 3450 RPM C-Face (3-2000) | 1 |
| | 9.800-032.0 | ▲ Label, Motor Overload Reset, Lexan | 1 |
| 42 | 8.912-873.0 | Support, Propane Tank, VHP | 1 |
| 43 | 9.802-792.0 | Nut, Cage, 3/8" x 12 Ga. | 16 |
| 44 | 8.912-864.0 | Brace, LP Bottle, VHP | 1 |
| 45 | 8.912-879.0 | Bracket, Propane Tank, VHP | 1 |
| 46 | 8.912-882.0 | Strap, Propane Tank, R/H VHP | 1 |
| 47 | 8.912-885.0 | Strap, Propane Tank, L/H VHP | 1 |
| 48 | 8.719-063.0 | Knob, 3/8" - 16 x 1-1/2" VHP | 1 |
| 49 | 9.804-029.0 | Pulley, AK64H, (2-15024D) | 1 |
| | 9.802-380.0 | Pulley, BK80H (3-20024A) | 1 |
| 50 | 8.715-517.0 | Pulley, Bore, AK21 x 5/8" (2-15024D) | 1 |
| | 9.802-377.0 | Pulley, BK32 (3-20024A) | 1 |
| | 9.803-897.0 | ▲ Bushing, H x 3/4 (3-20024A) | 1 |
| 51 | 9.802-402.0 | Bushing, HX24mm | 1 |
| 52 | 9.804-026.0 | Belt, AX31 (2-15024D) | 1 |
| | 9.802-413.0 | Belt, BX32 (3-20024A) | 1 |

# EXPLODED VIEW PARTS LIST

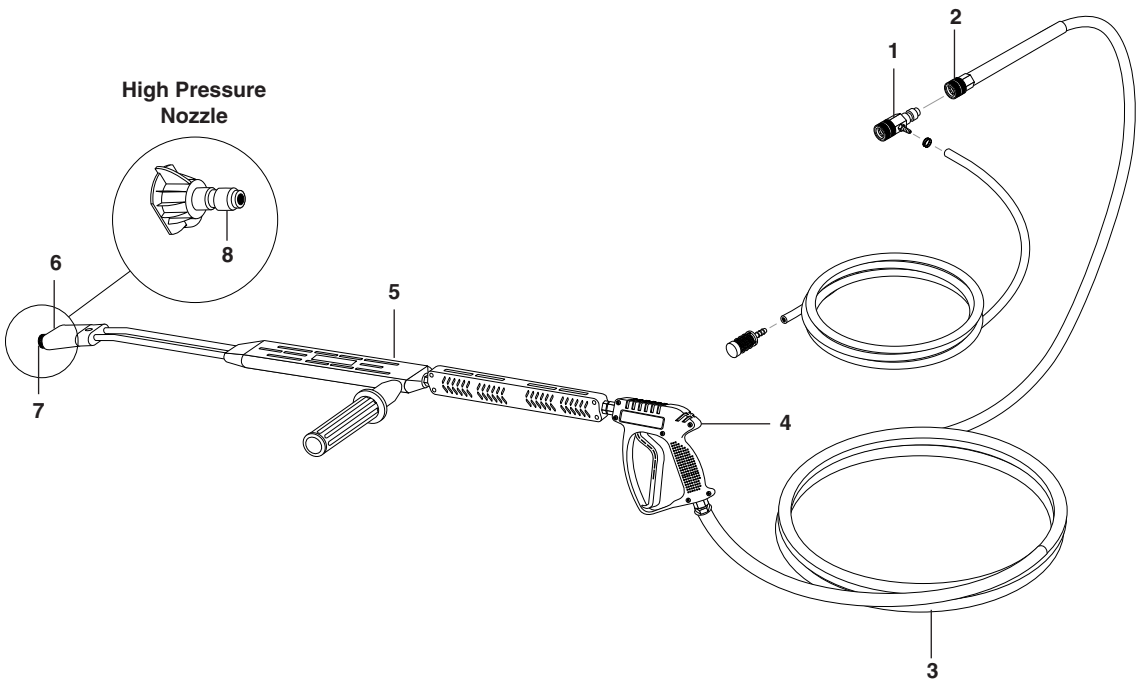
| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 53 | 8.717-749.0 | Regulator, Propane, R532CFF | 1 |
| 54 | 8.711-851.0 | Hose, 3/8" x 10', Propane Assembly | 1 |
| 55 | 8.717-790.0 | Tank, Propane 10.5 Gal. 30 lb. w/ Gauge Optional | 1 |
| 56 | 8.712-185.0 | Switch, Snap, 225 DR Hi-Limit | 1 |
| 57 | 9.149-003.0 | Manifold Coil Outlet Discharge | 1 |
| 58 | 9.802-171.0 | Nipple, 3/8" x 3/8" NPT ST Male | 1 |
| 59 | 9.802-013.0 | Nipple, 1/2" x 2.5" Galv. | 2 |
| 60 | 8.706-248.0 | Plug, 3/8" Allen Counter sunk | 1 |
| 61 | 8.706-216.0 | Tee, 1/2", FPT Steel | 1 |
| 62 | 4-02110000 | Hose, 1/2", Push-On | 2.5 ft. |
| 63 | 9.802-043.0 | Elbow, 1/2" JIC x 1/2" Fem, 90 DGR | 1 |
| 64 | 8.915-981.0 | Wrap, Outer Coil, VHW | 1 |
| | 9.800-021.0 | ▲ Label, Hot Water Outlet | 1 |
| 65 | 9.803-134.0 | Coil, Dura, 14.5" Dia, Sch 80 | 1 |
| 66 | 8.719-968.0 | Holder, Wand, VHW/VHP Zinc Plated | 1 |
| 67 | 9.803-029.0 | Tank Head Assembly, 16" Dia x 8" Stack | 1 |
| 68 | 9.800-006.0 | Label, "Hot/Caliente" w/Arrows | 2 |
| 69 | 9.802-825.0 | Retainer Clip | 4 |
| 70 | 9.802-904.0 | Insulation, Tank Head 16" OD x 8" ID | 1 |
| 71 | 8.912-899.0 | Handle, VHW/VHP/MVP w/HNG | 1 |
| 72 | 8.912-871.0 | Panel, Chassis, Front/Back | 1 |
| 73 | 8.912-881.0 | Reflector, Pilot Light, VHP/VHG | 1 |
| 74 | 9.802-678.0 | Ignitor, Piezo | 1 |
| 75 | 8.912-875.0 | Support, Burner Ring | 1 |
| 76 | 9.802-778.0 | Nut, Whiz Loc 5/16 Flange | 4 |
| 77 | 8.904-857.0 | Pump, Landa LD3030, 3@ 3000 | 1 |
| 78 | 8.912-920.0 | Retainer, Take-up, Pump | 1 |
| 79 | 9.802-733.0 | Bolt, 3/8" x 3-1/2" Tap | 2 |
| 80 | 9.803-131.0 | Rail, Pump Combo | 1 |
| 81 | 8.912-923.0 | Base, Main, VHP, Belt | 1 |
| 82 | 8.718-054.0 | Burner Ring, X-11 w/640-69 Jet Orifices | 1 |
| 83 | 9.802-064.0 | Grommet, Rubber, Nozzle Holder | 1 |
| 84 | 9.802-463.0 | Fuse, Paper, Buss FNM-1/2 250V Midget TD (Electronic Ignition Option) | 1 |
| 85 | 8.912-890.0 | Bracket, Pilot Light, VHP/VHG | 1 |
| | 8.719-957.0 | Bracket, Pilot Light, VNG-S (Electric Ignition) | 1 |
| 86 | 8.718-150.0 | Pilot, VHP | 1 |
| | 8.718-075.0 | ▲ Orifice, Pilot, LP, Small | 1 |
| | 9.803-610.0 | ▲ Pilot, Ignitor (Electric Ignition) | 1 |
| | 9.803-562.0 | ▲ Cable, Ignition, 48" (Electric Ignition) | 1 |
| 87 | 8.718-092.0 | Thermocouple, 24" White Rodgers | 1 |
| 88 | 9.802-681.0 | Wire, 15" Assembly | 1 |
| | 9.802-682.0 | ▲ TCB, GND | 1 |
| 89 | 8.718-069.0 | Electrode, Piezo Assembly | 1 |
| 90 | 9.802-911.0 | Tubing, Aluminum, 1/4" Deadsoft | 36" |
| 91 | 8.912-868.0 | Axle, 23", VHW | 2 |
| 92 | 90-4005 | Washer, 5/8", Flat, SAE | 4 |
| 93 | 9.800-031.0 | Label, VHP Pilot Light | 1 |
| 94 | 4-0303 | Wheel and Tire Assy, 4" w/Tube | 4 |
| 95 | 9.802-782.0 | Collar, 5/8" Bore Shaft | 4 |
| 96 | 9.802-027.0 | Elbow, 3/4", Black, 90° | 1 |
| 97 | 9.802-018.0 | Nipple, 3/4" x 3". Black Pipe | 2 |
| 98 | 9.802-049.0 | Union, 3/4", Black Pipe | 1 |
| 99 | 8.718-045.0 | Valve, Gas, WR 36103A-410, 3/4" | 1 |
| | 9.803-616.0 | ▲ Valve, Gas (Elec Ign) | 1 |
| | 9.803-618.0 | ▲ LP convert Kit (Elec Ign) | 1 |
| 100 | 8.912-858.0 | Axle, Holder Assembly VHW/VHP | 2 |
| 101 | 8.706-108.0 | Nipple, Blk, Pipe 3/4" x 3-1/2" | 1 |
| 102 | 8.718-648.0 | U-Bolt, 1/4" x 1-1/2" x 2-1/2" w/Plate | 2 |
| 103 | 8.706-108.0 | Nipple, 3/4" x 3-1/2", Black Pipe | 1 |
| 104 | 8.706-222.0 | Tee, 3/4" NLK Pipe | 1 |
| 105 | 9.802-018.0 | Nipple, 3/4" x 3", Black Pipe | 1 |
| 106 | 8.706-320.0 | Cap, 3/4", Black Pipe | 1 |
| 107 | 8.912-877.0 | Support, Gas Train, VHP/VHG | 1 |
| 108 | 9.804-608.0 | Cap, Vinyl FKT (Yellow) | 1 |
| 109 | 8.912-930.0 | Assy, Lever Brake | 1 |
| 110 | 8.912-928.0 | Bracket, Wheel Brake | 1 |
| 111 | 8.718-980.0 | Washer, 5/16", Flat, SAE | 12 |
| 112 | 9.802-775.0 | Nut, 1/4" Flange, Whiz Loc | 8 |

# EXPLODED VIEW PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 114 | 8.725-394.0 | Washer, 3/8", SAE, Flat | 8 |
| 115 | 8.718-785.0 | Screw, 3/8" x 3/8", SCKT SHDR, Zinc | 1 |
| 116 | 90-1995 | Screw, 1/4" x 1/2" BH SOL CS | 4 |
| 117 | 9.802-684.0 | Jet Orifice #69, Drill to #66 | 32 |
| 118 | 9.802-769.0 | Screw, 3/8" x 1-3/4" Whiz Loc | 4 |
| 119 | 9.802-781.0 | Nut, 3/8" Flange Whiz Loc | 11 |
| 120 | 9.802-767.0 | Screw, 3/8" x 3/4" Whiz Loc | 18 |
| 121 | 8.932-965.0 | Label, Exposed Pulley | 2 |
| 122 | 9.802-794.0 | Nut, Cage, 1/4" x 12 GA | 10 |
| 123 | 8.706-168.0 | Elbow, 3/8" Male Pipe | 1 |
| 124 | 9.151-014.0 | Rupture Disk, 5000 PSI | 1 |
| 125 | 8.916-090.0 | Label, Landa | 2 |
| 126 | 8.706-109.0 | Nipple, 3/8" x 7", Black Pipe | 1 |
| 127 | 8.933-007.0 | Fuse, KTK-R1 600V Midget Fuse (Electronic Ignition Option) | 2 |
| 128 | 90-19710 | Screw, 1/4" x 3/4", Whiz Loc | 5 |
| 129 | 8.900-300.0 | Label, Landa | 1 |
| 130 | 8.932-963.0 | Label, Liquid Propane | 1 |
| 131 | 8.900-829.0 | Label, VHP, Propane Tank | 1 |
| 132 | 8.912-894.0 | Brace, Chassis | 1 |
| 133 | 9.184-030.0 | Spacer, Rupture Disk | 1 |
| 134 | 8.707-019.0 | Hose Barb, 1/2" Barb x 3/8" MPT, Push-On | 1 |
| 135 | 9.800-018.0 | Label, Tipover Hazard | 1 |
| 136 | 9.800-049.0 | Label, Manufacturer's Cleaning Solutions | 1 |
| 137 | 9.803-613.0 | Module, Ignition (Electric Ign.) | 1 |
| 138 | 9.803-108.0 | Retainer Ring, Insulation | 1 |
| 139 | 8.718-618.0 | Bolt, 5/16" x 3/4" NC | 4 |
| 140 | 9.802-518.0 | Strain Relief 3/4 | 1 |

▲ Not Shown

# HOSE & SPRAY GUN EXPLODED VIEW




# HOSE & SPRAY GUN EXPLODED VIEW PARTS LIST

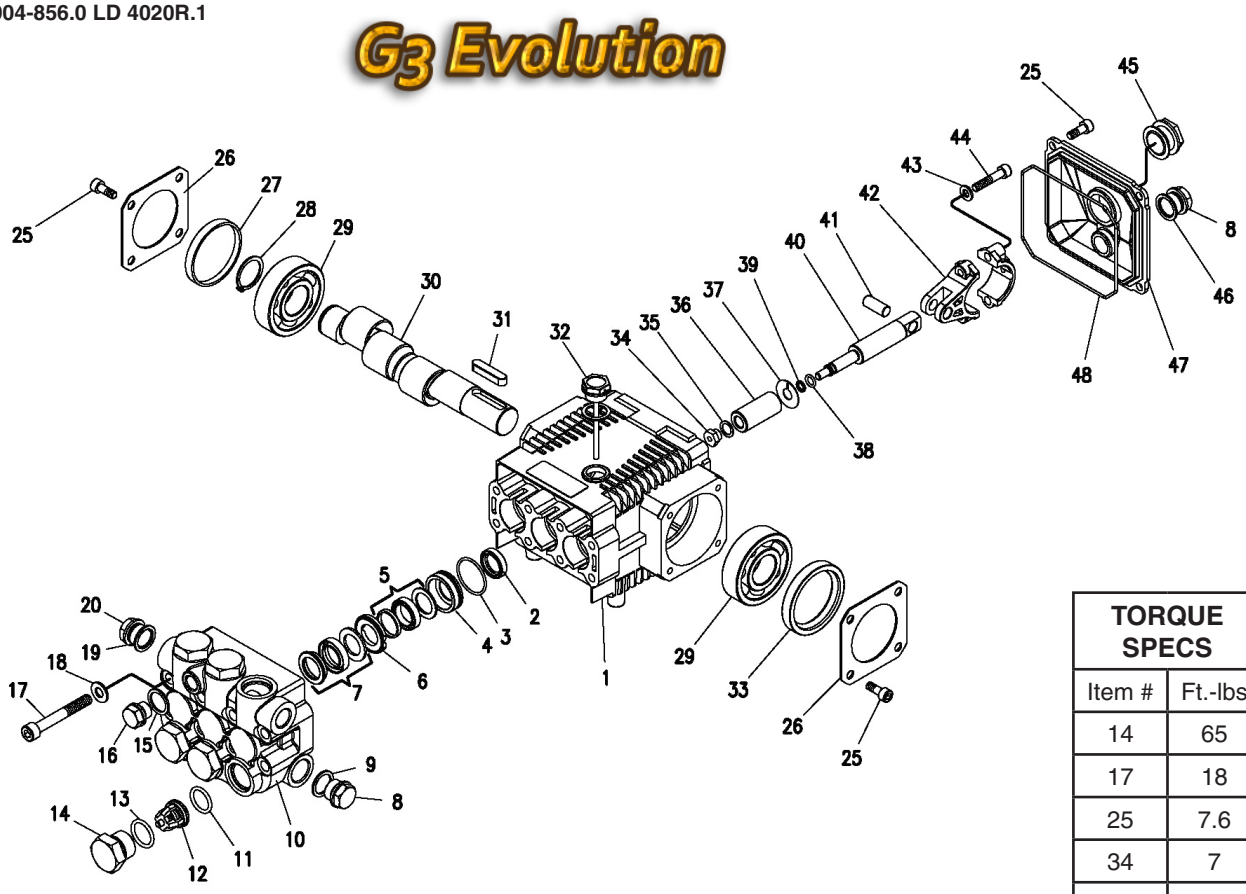
| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 9.802-224.0 | Downstream Injector Assy., Non Adj #2, 2-3 GPM | 1 |
| 2 | 9.802-166.0 | Coupler, 3/8" Female | 1 |
| | 9.802-100.0 | ▲ Quick Coupler O-Ring, 3/8" | 1 |
| 3 | 8.739-026.0 | Hose, 3/8" x 50', 1-Wire, Tuff-Skin | 1 |
| 4 | 8.751-234.0 | Gun, Landa, L1050, 5000 PSI, 10.4 GPM | 1 |
| 5 | 8.711-293.0 | Wand, Only, VP, Zinc | 1 |
| 6 | 9.802-286.0 | Brass Soap Nozzle, 1/8" | 1 |

| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 7 | 9.802-165.0 | Coupler, 1/4" Male, Brass | 1 |
| | 9.802-096.0 | ▲ Quick Coupler O-Ring, 1/4" | 1 |
| 8 | 8.712-333.0 | Nozzle, SAQCMEG 1503, Yellow (2-1500) | 1 |
| | 8.712-338.0 | Nozzle, SAQCMEG, 15035, Yellow (3-2000) | 1 |
| | 8.712-346.0 | Nozzle, SAQCMEG 1504, Yellow (2-1100) | 1 |
| | 8.712-358.0 | Nozzle, SAQCMEG 1505.5 Yellow (3-700) | 1 |

▲ Not Shown

# LD.1 SERIES PUMP EXPLODED VIEW

**8.725-169.0 LD 3025R.1**
**8.904-857.0 LD 3030R.1**
**8.904-856.0 LD 4020R.1**




| TORQUE SPECS | |
|---|---|
| Item # | Ft.-lbs |
| 14 | 65 |
| 17 | 18 |
| 25 | 7.6 |
| 34 | 7 |
| 44 | 13 |

# LD.1 SERIES PUMP EXPLODED VIEW PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 9.803-938.0 | Crankcase | 1 |
| 2* | See Kits Below | Plunger Oil Seal | 3 |
| 3* | See Kits Below | O-Ring Ø1.78 x 28.30 | 3 |
| 4* | See Kits Below | Pressure Ring 15mm (3030) | 3 |
| | See Kits Below | Pressure Ring 18mm (4020, 3025) | 3 |
| 5* | See Kits Below | U-Seal, 15mm (3030) | 3 |
| | See Kits Below | U-Seal, 18mm (4020, 3025) | 3 |
| 6* | See Kits Below | Intermediate Ring 15mm (3030) | 3 |
| | See Kits Below | Intermediate 18mm (4020, 3025) | 3 |
| 7* | See Kits Below | Intermed. Ring 15mm (3030) | 3 |
| | See Kits Below | Intermed. Ring 18mm (4020, 3025) | 3 |
| 8 | 9.802-926.0 | Brass Plug 1/2" | 1 |
| 9 | 9.803-199.0 | Copper Washer 1/2" | 1 |
| 10 | 9.803-946.0 | Manifold Housing | 1 |

| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 11* | 9.803-947.0 | O-Ring Ø1.78 x 15.54 | 6 |
| 12* | See Kits Below | Valve Assembly | 6 |
| 13* | 9.803-948.0 | O-Ring Ø2.62 x 18.77 | 6 |
| 14 | 9.803-949.0 | Valve Plug | 6 |
| 15 | 9.803-950.0 | Copper Washer 1/4 | 1 |
| 16 | 9.803-951.0 | Brass Plug G1/4 | 1 |
| 17 | 9.803-952.0 | Manifold Stud Bolt | 8 |
| 18 | 9.802-884.0 | Washer | 8 |
| 19 | 9.803-198.0 | Copper Washer 3/8 | 1 |
| 20 | 9.802-925.0 | Brass Plug 3/8 | 2 |
| 25 | 9.802-939.0 | Screw | 12 |
| 26 | 9.803-953.0 | Bearing Cover | 2 |
| 27 | 9.803-954.0 | Bearing Seal | 1 |
| 28 | 9.802-914.0 | Snap Ring | 1 |
| 29 | 9.803-955.0 | Ball Bearing | 2 |
| 30 | 9.803-956.0 | Crankshaft | 1 |
| 31 | 9.803-167.0 | Crankshaft Key | 1 |
| 32 | 9.803-957.0 | Oil Dipstick | 1 |

# LD.1 SERIES PUMP EXPLODED VIEW PARTS LIST (CONT)

| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 33 | 8.933-010.0 | Crankshaft Seal | 1 |
| 34* | See Kits Below | Plunger Nut | 3 |
| 35* | See Kit Below | Copper Spacer | 3 |
| 36* | See Kits Below | Plunger, 15mm (3030) | 3 |
| | See Kits Below | Plunger, 18mm (4020, 3025) | 3 |
| 37* | See Kits Below | Copper Spacer | 3 |
| 38* | See Kits Below | O-Ring Ø1.78 x 5.28 | 3 |
| 39* | See Kits Below | Teflon Ring | 3 |
| 40* | See Kits Below | Plunger Rod | 3 |
| 41 | 9.803-965.0 | Connecting Rod Pin | 3 |
| 42 | 9.803-966.0 | Connecting Rod | 3 |
| 43 | 9.803-218.0 | Spring Washer | 6 |
| 44 | 8.933-020.0 | Connecting Rod Screw | 6 |
| 45 | 9.803-202.0 | Sight Glass | 1 |
| 46 | 9.803-197.0 | Gasket | 1 |
| 47 | 9.803-968.0 | Crankcase Cover | 1 |
| 48 | 9.803-969.0 | O-Ring Ø2.62 x 107.62 | 1 |

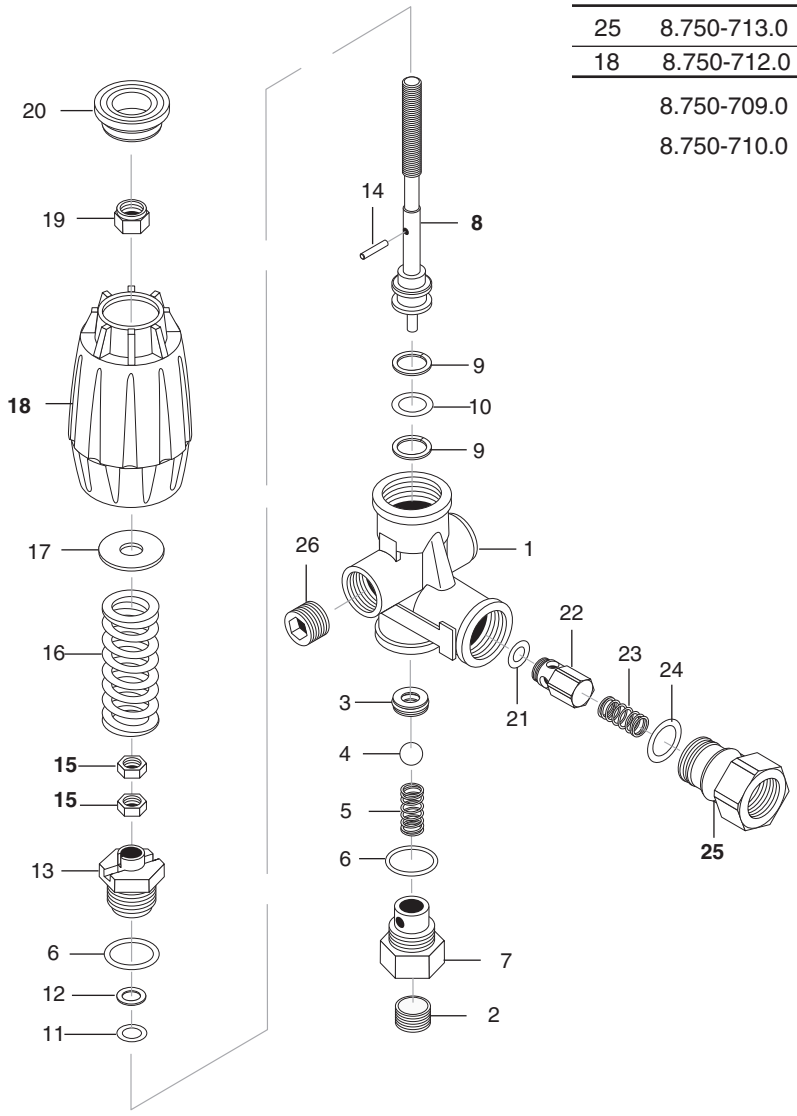
* Available in kit (See below)

| **REPAIR KIT NUMBER** | **8.725-354.0** | **8.725-356.0** | **8.725-355.0** | **8.725-357.0** | **9.803-934.0** | **9.803-935.0** | **9.803-936.0** | **9.803-937.0** |
|---|---|---|---|---|---|---|---|---|
| **KIT DESCRIPTION** | Plunger Seal 15mm LD-3030 | Plunger Seal 18mm LD-3025 LD-4020 | Complete Seal Packing, 15mm LD-3030 | Complete Seal Packing, 18mm LD-3025 LD-4020 | Plunger 15mm LD-3030 | Plunger 18mm LD-3025 LD4020 | Complete Valve | Plunger Oil Seals |
| **ITEM NUMBERS INCLUDED** | 3, 5, 7 | 3, 5, 7 | 3, 4, 5, 6, 7 | 3, 4, 5, 6, 7, | 34, 35, 36, 37, 38 | 34, 35, 36, 37, 38 | 11, 12, 13 | 2 |
| **NUMBER OF CYLINDERS KIT WILL SERVICE** | 3 | 3 | 1 | 1 | 1 | 1 | 6 | 3 |

# VRT3 UNLOADER EXPLODED VIEW AND PARTS LIST

**8.750-297.0,** 8 GPM, 2320 PSI
**8.750-298.0,** 8 GPM, 3630 PSI
**8.750-299.0,** 8 GPM, 4500 PSI

| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 25 | 8.750-713.0 | Outlet Fitting | 1 |
| 18 | 8.750-712.0 | Knob, Unloader | 1 |
| | 8.750-709.0 | Repair Kit, VRT3, 2320/3630 PSI | |
| | 8.750-710.0 | Repair Kit, VRT3, 4500 PSI | |
| | | (Kit Items: 3, 4, 6, 9-12, 21, 24) | |




## Unloader Adjustment Procedures

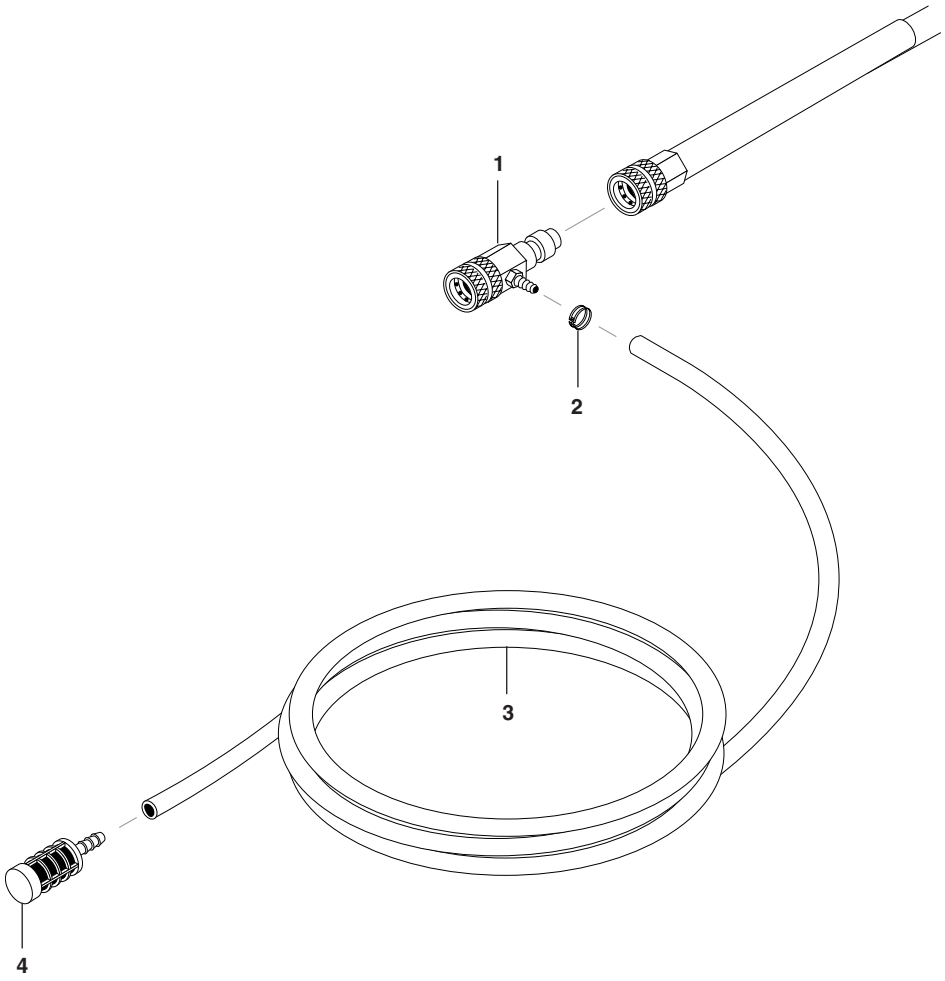
1. Remove lock nut (Item 19).
2. Remove adjustment knob (Item 18).
3. Loosen the two (2) nuts (Item 15), move them upward on stem (Item 8) until you see 4 or more threads below the nut.
4. Re-attach adjusting knob (Item 18).
5. Start machine. Open the trigger of the spray gun. Increase pressure by turning adjustment knob (Item 18) clockwise until pressure is at the desired operating pressure.
6. Remove the adjustment knob (Item 18), tighten the lower nut (Item 15) tightly against the upper nut (Item 15). Re-attach adjustment knob (Item 18) and screw down until contact is made with the nuts (Items 15). Screw down lock nut (Item 19) onto the stem (Item 8) until the threads cut into the nylon insert of the lock nut (Item 19).

***If adjustment knob (Item 18) **DOES NOT** make contact with upper nut (Items 15), remove adjusting knob (Item 18), re-adjust (raise) nuts (Items 15) on stem (Item 8) and re-attach adjustment knob (Item 18), then repeat step #6.

****If adjustment knob (Item 18) **DOES** make contact with upper nut; release the trigger of the spray gun and watch the pressure gauge for the pressure increase ("spike"). This "spike" **SHOULD NOT** exceed 500 psi above the operating pressure. If "spike" pressure exceeds the 500 psi limit, remove the adjusting knob (Item 18) and re-adjust (lower) the nuts (Items 15) on the stem (Item 8). Re-attach the adjusting knob (Item 18), then repeat step #6.

# INJECTOR ASSEMBLY #2 — 4-011182

**3-700, 3-1100, 3-2000**




| ITEM | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 9.802-215.0 | Injector, Detergent, Non Adjust, #2, 2-3 GPM | 1 |
| 2 | 6.390-126.0 | Clamp, Hose, .46-, .54 ST | 1 |
| 3 | 4-02080000 | Tube, 1/4" x 1/2", Clear Vinyl | 6 ft. |
| 4 | 8.707-057.0 | Strainer, 1/4", Hose Barb | 1 |

LANDA®

# LANDA LIMITED NEW PRODUCT WARRANTY
# PRESSURE WASHERS

## WHAT THIS WARRANTY COVERS

All LANDA pressure washers are warranted by LANDA to the original purchaser to be free from defects in materials and workmanship under normal use, for the periods specified below. This Limited Warranty is subject to the exclusions shown below, is calculated from the date of the original purchase, and applies to the original components only. Any parts replaced under this warranty will assume the remainder of the part's warranty period.

## SEVEN YEAR PARTS AND ONE YEAR LABOR WARRANTY:

Components manufactured by LANDA, such as frames, handles, top and bottom wraps, float tanks, fuel tanks, belt guards, and internal components on the oil-end of Landa manufactured pumps. General, AR, Liberty, Comet and swash and wobble plate pumps have a one year warranty. Heating coils have a five year warranty from date of original machine purchase.

## ONE YEAR PARTS AND ONE YEAR LABOR WARRANTY:

All other components, excluding normal wear items as described below, will be warranted for one year on parts and labor. Parts and labor warranty on these parts will be for one year regardless of the duration of the original component manufacturer's part warranty.

## WARRANTY PROVIDED BY OTHER MANUFACTURERS:

Motors, generators, and engines, which are warranted by their respective manufacturers, are serviced through these manufacturers' local authorized service centers. LANDA is not authorized and has no responsibility to provide warranty service for such components.

## WHAT THIS WARRANTY DOES NOT COVER

This warranty does not cover the following items:

1. Normal wear items, such as nozzles, spray guns, discharge hoses, wands, quick couplers, seals, filters, gaskets, O-rings, packings, pistons, pump valve assemblies, strainers, belts, brushes, rupture disks, fuses, pump protectors.
2. Damage or malfunctions resulting from accidents, abuse, modifications, alterations, incorrect installation, improper servicing, failure to follow manufacturer's maintenance instructions, or use of the equipment beyond its stated usage specifications as contained in the operator's manual.
3. Damage due to freezing, chemical deterioration, scale build up, rust, corrosion, or thermal expansion.
4. Damage to components from fluctuations in electrical or water supply.
5. Normal maintenance service, including adjustments, fuel system cleaning, and clearing of obstructions.
6. Transportation to service center, field labor charges, or freight damage.

## WHAT YOU MUST DO TO OBTAIN WARRANTY SERVICE

While not required for warranty service, we request that you register your LANDA pressure washer by returning the completed registration card. In order to obtain warranty service on items warranted by LANDA, you must return the product to your Authorized LANDA Dealer, freight prepaid, with proof of purchase, within the applicable warranty period. If the product is permanently installed, you must notify your Authorized LANDA Dealer of the defect. Your Authorized LANDA Dealer will file a claim with Landa, who must subsequently verify the defect. In most cases, the part must be returned to LANDA freight prepaid with the claim. For warranty service on components warranted by other manufacturer's, your Authorized LANDA Dealer can help you obtain warranty service through these manufacturers' local authorized service centers.

## LIMITATION OF LIABILITY

LANDA'S liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall LANDA'S liability exceed the purchase price of the product in question. LANDA makes every effort to ensure that all illustrations and specifications are correct, however, these do not imply a warranty that the product is merchantable or fit for a particular purpose, or that the product will actually conform to the illustrations and specifications. Our obligation under this warranty is expressly limited at our option to the replacement or repair at a service facility or factory designated by us, of such part or parts as inspection shall disclose to have been defective. **THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY.** LANDA does not authorize any other party, including authorized LANDA Dealers, to make any representation or promise on behalf of LANDA, or to modify the terms, conditions, or limitations in any way. It is the buyer's responsibility to ensure that the installation and use of LANDA products conforms to local codes. While LANDA attempts to assure that its products meet national codes, it cannot be responsible for how the customer chooses to use or install the product. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

**LANDA**

www.landa.com



LANDA VHP • 8.913-949.0 • Rev. 5/13

# INTRODUCCION & SEGURIDAD DE LA MAQUINA

Gracías por comprar un Lavadora a Presión Landa.

Estas instrucciones y advertencias corresponden a los modelos VHP.

Landa se reserva el derecho de hacer cualquier cambio en cualquier momento sin contraer ninguna obligación.

### Responsabilidades del Dueño/Usuario:

El dueño y/o usuario debe estar al tanto de las instrucciones de operación y de las advertencias del fabricante antes de usar su lavadora a presión Landa. La información de advertencia debe ser enfatizada y comprendida. Si el operador no domina el inglés, el comprador/dueño deberá leer y discutir con éste las instrucciones y las advertencias del fabricante en el idioma natal del operador, asegurándose de que éste entienda su contenido.

El dueño y/o usuario debe estudiar y mantener las instrucciones del fabricante para futuras referencias.

### CUIDAR ESTAS INSTRUCCIONES

**Este manual debe ser considerado una parte permanente de la máquina y debe quedarse consigo si máquina es revendida. Al ordenar las partes, especifican por modelo y número de serie. Utilice repuestos sólo idénticos. Esta máquina debe ser utilizada solamente por los operadores entrenados.**

## SEGURIDAD DE LA MAQUINA

***PRECAUCION: Para reducir el riesgo de accidentes, lea las instrucciones cuidadosamente antes de usar la unidad.***

1. Lea todo el manual para operadores cuidadosamente. Al no seguir las instrucciones puede causar el mal funcionamiento de la unidad y provocar la muerte, o causar serias heridas y/o daños en la propiedad.
2. Todas las instalaciones deben cumplir con los códigos locales. Póngase en contacto con un técnico eléctrico, plomero, compañía de servicios públicos o distribuidor de ventas para mayores detalles.

***ADVERTENCIA: Riesgo de asfixia. Use este producto solo en areas bien ventiladas.***

3. Evite instalar unidades en áreas pequeñas o cerca de ventiladores de gases de escape. Los gases de escape contienen gas venenoso de monóxido decarbono; la exposición puede causar pérdida del conocimiento y causar la muerte. Los gases de escape también contienen químicos, en ciertas cantidades, que se sabe, causan cáncer, defectos de nacimiento, o daños al sistema reproductivo.

***ADVERTENCIA: Liquidos inflamables pueden crear gases que se encienden causando daños a la propiedad y heridas severas.***

4. Aparatos de encendido con petróleo deberán de ser instalados en lugares donde residuos de combustibles, vapores o gases inflamables no estén normalmente presentes.

   En modelos de encendido con petróleo utilice únicamente kerosene #1 o diesel. No utilize gasolina, solventes o alcohol. El utilizarlo resultará en fuego y/o explosión.

***ADVERTENCIA: Mantenga el chorro de agua, la varilla y la manguera de alta presion lejos del cableado electrico ya que puede ocurrir un choque fatal. lea la etiqueta de avertencia del cable electrico.***

5. Para proteger al operador de un choque eléctrico, la máquina deberá de estar conectada a tierra. Es la responsabilidad del dueño de conectar esta máquina a un receptáculo a tierra aprobado por UL con el amperage y voltaje indicados. No moje sobre o cerca de los componentes eléctricos; no toque la máquina con las manos mojadas o cuando esté parado sobre agua. Siempre desconecte la máquina cuando le dé servicio de mantenimiento.

**ADVERTENCIA: Sostenga la pistona aspersora con ambas manos ya que con la alta presion esta puede tener retroceso.**

6. Sujete firmemente con ambas manos la varilla aspersora antes de encender la maquina; de no seguir esta recomendación puede resultar en heridas por golpe de la misma.
7. No coloque la máquina cerca de objetos inflamables si el motor esta caliente.

# SEGURIDAD DE LA MAQUINA

***ADVERTENCIA: Este equipo puede producir un fluido de alta presion a chorro que puede penetrar la piel y sus tejidos, causando graves heridas y posible amputacion.***

8. No reemplazar el tanque depropano líquido mientras la unidad está funcionando. Podrían ocurrir accidentes serios.

***ADVERTENCIA: Usar combustible líquido solamente.***

9. Este equipo está diseñado para funcionar a gas. No usar combustible líquido. Disponer de un técnico de servicio calificado para instalar y proveer servicio de mantenimiento a su equipo.
10. El agua de ingreso debe estar fría.
11. No operar el equipo cuando se esté fatigado o bajo la influencia de alcohol o drogas. Mantener el área de operación libre de personas.
12. Nunca producir chispas o llamas donde exista la presencia de gas.
13. Nunca intentar encender el piloto a menos que la válvula manual haya estado cerrada por 5 minutos.
14. Nunca operar la máquina con el tanque de propano líquido colocado en el soporte. Retirar el tanque de propano líquido de la máquina tan lejos como lo permita la manguera.
15. Los gases de propano líquido son más pesados que el aire y se esparcirán sobre el piso. Proveer siempre espacio y ventilación adecuados alrededor de estas unidades.
16. Durante las reparaciones, desconectar el suministro eléctrico y cerrar la válvula de gas.
17. Apagar el quemador, abrir la pistola de paso y enfriar hasta 100° F antes de apagar la máquina.
18. La máquina no debe estar desatendida durante la operación.
19. No adecuada para conectar un respiradero de gas Tipo B, si la temperatura de la chimenea excede 243° C (470° F).
20. Sila máquina va a ser instalada en forma permanente, instalar una campana de tiro con la descarga de gases fuera del edificio.

***ADVERTENCIA: Si se percibe olor a gas, cerrar el suministro de gas.***

21. Si se percibe olor a gas, cerrar el suministro de gas, apagar toda llama abierta y revisar las uniones aplicando una solución de jabón. Si el olor persiste, llamar a su proveedor de gas inmediatamente.

# INSTALACION

Colocar la máquina en una ubicación conveniente, con amplio apoyo, drenaje y espacio para servicio de mantenimiento.

**Este equipo es para uso en interior.**

## Ubicación:

La ubicación deberá proteger la máquina de las condiciones perjudiciales del medio ambiente, tales como viento, lluvia y congelamiento.

1. La máquina deberá funcionar en una superficie nivelada donde no sufra la influencia de factores externos tales como vientos fuertes, temperaturas de congelamiento, lluvia, etc. Al seleccionar la ubicación, considerar accesibilidad para reemplazar Tanques de propano líquido, reabastecer detergentes, reajustes y mantenimiento. El operador deberá tomar precauciones para prevenir los excesos de humedad que puedan afectar los componentes eléctricos.
2. Es recomendable hacer una partición entre el área de lavado y la máquina para prevenir el rociado directo de la pistola cuando está en contacto con la máquina. La humedad excesiva en los controles eléctricos reducirá la vida útil de la unidad y podría causar cortocircuitos.
3. Durante el montaje, evitar áreas con ventilación insuficiente o áreas donde los ventiladores generen insuficiente suministro de oxígeno. Se puede obtener una buena combustión, solamente cuando hay suficiente suministro de oxígeno disponible para la cantidad de combustible incinerado. Si se instala en una área con ventilación insuficiente, suministrar aire fresco exterior al quemador con un ventilador instalado dentro del ambiente. Evitar espacios estrechos o áreas cerca de ventiladores.

## Regulaciones Sobre Gases:

Consultar con la compañía de gas local y con las autoridades municipales respecto a las normas o regulaciones específicas que rijan el montaje. El montaje debe hacerse de acuerdo con las regulaciones municipales locales.

## Aspecto Eléctrico:

Esta máquina, al ser instalada, debe ser puesta a tierra según las regulaciones municipales locales. Verificar el adecuado suministro de energía usando un voltímetro. El voltímetro VHP2-15021D requiere un receptáculo de 20 amp para cumplir con los estándares de certificación UL 1776.

## Respiradero:

Cuando la lavadora a presión es instalada en un espacio muy estrecho sin aberturas de ventilación al exterior, deben tomarse medidas para suministrar aire de combustión a través de aberturas especiales, una cerca del piso y otra cerca del techo; cada una medida en base a una pulgada cuadrada o más de área libre por cada 1,000 BTU de consumo por hora.

## Colocación:

No colocar la máquina cerca de materiales combustibles. Mantener todo material inflamable a 20 pies de distancia por lo menos.

Permitir suficiente espacio para dar servicio de mantenimiento a la unidad.

Regulaciones municipales locales requieren mantener ciertas distancias entre el piso y las paredes.

(Dos pies de distancia deberían ser suficientes.)

## Suministro de Agua:

El suministro de agua para la unidad deberá ser provisto por una manguera de jardin de 5/8" de diámetro interno con una presión de agua local no menor a 30 psi. Si el suministro de agua es insuficiente, o si la manguera está torcida, la unidad funcionará mal y el quemador no arrancará.

## Conexión:

Conectar la varilla, boquilla y pistola (como corresponda). En las conexiones de tubería de rosca, usar cinta de teflón para evitar fugas de agua. (Ver Identificación del Componente.)

Conectar la manguera de alta presión al niple de descarga jalando el collar de acoplamiento hacia atrás e insertándolo en el niple de descarga. Luego, empujar el collar hacia adelante para asegurarlo. Un inyector detergente podría ser insertado entre el acoplamiento de la manguera y el niple de descarga.

Colocar el tubo de productos detergentes en el jabón líquido o solución detergente. Evitar que el tubo succione aire.

***PRECAUCION: Al instalar la manguera de gas propano al Tanque de propano líquido, por favor, notar que las roscas están hacia la izquierda.***

## Inspección y Prueba:

Antes de mantener el gas a presión en las tuberías, cerrar todas la aberturas por donde pueda escapar el gas. Inmediatamente después de encender el gas, debe revisarse el sistema en busca de fugas. Esto puede hacerse observando el indicador de prueba de ½ pie cúbico y esperando 5 minutos para observar cualquier movimiento, o aplicando una solución de jabón a cada conexión de la tubería y observando las burbujas. Si se detectan fugas, hacer las reparaciones necesarias y repetir la prueba anterior.

# INSTALACION

Las tuberías y accesorios defectuosos deben ser cambiados, no deben ser reparados. Nunca usar ningún tipo de llama o fuego para localizar fugas de gas, usar una solución de jabón.

Luego que la tubería y el medidor han sido revisados completamente, purgar el aire del sistema. **NO** purgar el aire dentro de un ambiente cerrado.

La lavadora a presión y la válvula individual de cierre deben ser desconectados del sistema de tuberías de suministro de gas durante la prueba de presión donde una presión sobre ½ psig podría dañar la válvula de gas.

### Válvula de Cierre:

Se ha instalado una válvula de cierre entre la línea de suministro de gas y la lavadora. La instalación también incluye una unión entre la válvula de cierre y el quemador.

### Condensación en los Serpentines:

Cuando se bombea agua fría por los serpentines del calentador y los quemadores están encendidos, se producirá condensación sobre los serpentines y goteará al compartimiento del quemador dando la impresión de fugas en los serpentines, particularmente en días húmedos y fríos.

### Revisar el Serpentín del Calentador de Agua en busca de Fugas:

Con el quemador “APAGADO” arrancar la unidad de bombeo y dejar que funcione por unos minutos. Observar el compartimiento del quemador con una lámpara o una linterna de mano. Si no se observa ninguna fuga, el goteo de agua del serpentín será producto de la condensación de gases combustibles cuando el quemador está encendido, como se ha descrito en el párrafo anterior.

# INSTRUCCIONES PARA EL ENCENDIDO

***ADVERTENCIA: El incumplimiento de las instrucciones podría resultar en incendio o explosión causando daños a la propiedad, accidentes personales o fatales.***

1. El equipo tiene un piloto que puede ser encendido en forma manual. Al encender el piloto, seguir éstas instrucciones en forma estricta.
2. **ANTES DE ENCENDER** revisar alrededor del equipo para detectar posible olor a gas. Revisar al nivel del piso ya que el gas propano es más pesado que el aire y se acumula sobre el piso.

   **Para su seguridad: ”¿Qué hacer si se detecta olor a gas?”**

   a. **No tratar de encender ningún equipo.**
   b. **No tocar ningún interruptor eléctrico; no usar ningún teléfono del edificio.**
   c. **Llamar inmediatamente a su proveedor de gas usando un teléfono del vecindario. Seguir las instrucciones de su proveedor de gas.**
   d. **Si no se puede ubicar a su proveedor de gas, llamar al departamento de bomberos.**
3. Usar solamente la mano para presionar o girar la perilla de control del gas. Nunca usar herramientas. Si no se puede presionar o girar la perilla con la mano, no tratar de repararla, llamar a un técnico de servicio calificado. El uso de fuerza durante la reparación podría resultar en incendio o explosión.
4. No usar la máquina cuando una de sus partes ha estado sumergida en agua. Llamar inmediatamente a un técnico de servicio calificado para revisar la máquina y reemplazar cualquier parte del sistema de control o de control de gas que ha estado sumergida en agua.

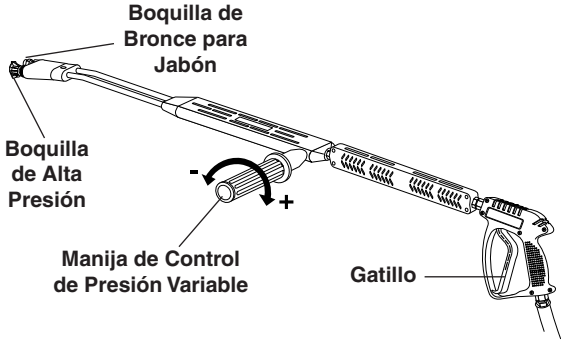
# INSTRUCCIONES DE OPERACION

1. **ALTO!** Leer cuidadosamente el manual del operador antes de operar esta máquina. El incumplimiento de las instrucciones y advertencias puede causar una operación defectuosa de la unidad y puede causar heridas serias y/o daños a la propiedad.
2. Apagar todos los interruptores.
3. Retirar y colocar el Tanque de propano líquido de la máquina tan lejos como lo permita la manguera de suministro.
4. Conectar la manguera de suministro de agua y abrir el agua. Accionar el gatillo de la pistola de rociado y dejar fluir agua hasta descargar todo el aire del sistema. Revisar si hay fugas de agua y ajustar según sea necesario.
5. Conectar el cable de energía a la conexión eléctrica apropiada de acuerdo a la información de la placa de serie. Presionar el botón de reajuste GFCI. El voltímetro VHP2-15021 D requiere un receptáculo de 20 amp para cumplir con la certificación UL.
6. Abrir la válvula del Tanque de propano líquido, luego presionar ligeramente la perilla de la válvula del control principal de gas que está sobre el costado derecho de la máquina y girar en dirección opuesta las agujas del reloj a la posición Piloto. **NOTA:** la perilla no puede ser girada de “Piloto” a “APAGADO” a menos que sea presionada ligeramente.
7. Presionar la perilla de control completamente y mantenerla en ésa posición. Después de cinco (5) segundos, presionar el encendedor rojo hasta escuchar un sonido fuerte. Repetir este paso 3 ó 4 veces, si fuera necesario, hasta encender el piloto. Si el piloto no enciende, repetir la operación permitiendo un período de tiempo más largo antes de soltar la perilla de la válvula de gas. Después que el piloto encienda, continuar manteniendo la perilla de control hacia abajo aproximadamente por un (1) minuto antes de soltarla. Observar la mirilla del piloto en la parte posterior de la máquina.
8. Girar la perilla de control de gas en el sentido opuesta a las agujas del reloj hasta el punto de “ENCENDIDO.”
9. Para operar con agua fría, girar el interruptor a la posición de la bomba y accionar el gatillo de la pistola de rociado.
   - Asegure la boquilla de alta presión en el ex tremo de la varilla.
   - Gire la manilla para ajustar la presión.
   - Para aplicar detergente debe usarse baja presión.
   - Lea el manual para operar, previamente.
10. Para operar con agua caliente, girar el interruptor a la posición del quemador y accionar el gatillo de la pistola de rociado.
11. Para aplicar detergente, leer las instrucciones sobre el uso del inyector detergente.
12. **Para Detener:** limpiar las líneas de productos detergentes con agua fresca, cambiar a la posición de la bomba y continuar rociando agua hasta enfriar el quemador.
13. Después que el agua se ha enfriado, apagar la bomba. Apagar la llave principal de gas, luego cerrar la válvula del Tanque de propano líquido. Revisar que el Tanque de propano líquido esté fijo a la máquina cuando ésta sea transportada.
14. Cerrar el agua. Para protección contra el congelamiento, accionar el gatillo de la pistola de rociado para drenar el agua del sistema.

## Para Usar Vapor:

(Modelo VHP3-70021D solamente)

1. Girar la perilla del control en descargador en el sentido opuesta a las agujas del reloj. Esto reduce el fluir del agua por el serpentín.
2. La presión del agua disminuirá aproximadamente a 250 psi y la temperatura aumentará aproximadamente 250° F.
3. Después de usar vapor, girar la perilla del control en el descargador en el sentido de la agujas del reloj hasta que pare. Bajará la temperatura. Antes de apagar la lavadora, dejar que funcione sin prender el quemador para enfriar el serpentín.



# MANTENIMIENTO PREVENTIVO

1. Revisar si la bomba de agua está lubricada apropiadamente.
2. Seguir las instrucciones para acondicionamiento de invierno y prevenir daños por congelamiento de la bomba y los serpentines.
3. Siempre neutralizar y limpiar después de usar productos detergentes en el sistema.
4. Si el agua tiene alto contenido de minerales, usar un ablandador de agua o eliminador de escamas en el sistema, según sea necesario.
5. No permitir que líquidos ácidos, caústicos o abrasivos sean bombeados a través del sistema.
6. Siempre usar productos de limpieza de alta calidad Landa.
7. Nunca hacer funcionar la bomba en seco por extensos períodos de tiempo.
8. Periódicamente, limpiar los depósitos de cal de los serpentines según las instrucciones.

Se aconseja inspeccionar regularmente, el quemador en forma visual. Revisar el ingreso de aire para asegurar que no esté atascado o bloqueado. Limpiar todos los derrames de aceite y mantener la máquina limpia y seca.

Las áreas alrededor de la lavadora Landa deberán mantenerse limpias y libres de materiales combustibles, gasolina y otros líquidos inflamables.

El flujo de combustión y aire de ventilación al quemador no deben ser obstruídos o bloqueados de ninguna manera.

# MANTENIMIENTO Y SERVICIO

## Válvulas de Descarga:

Las válvulas de descarga liberan la presión en la línea cuando la pistola de rociado está cerrada. La válvulas de descarga son programadas y verificadas antes de salir de fábrica. Ocasionalmente, deben regularse para mantener la presión correcta. (Ver la sección del manual sobre válvulas de descarga para el procedimiento correcto de regulación de la válvula.)

## Procedimiento de Acondicionamiento para el Invierno:

El daño debido al congelamiento no está cubierto por la garantía. Respetar los siguientes procedimientos para el clima frío siempre que la lavadora deba almacenarse u operarse a la intemperie bajo condiciones de congelamiento.

Durante los meses de invierno, cuando la temperatura baja a menos de 32° F, se debe proteger la máquina del congelamiento según sea necesario. Almacenar la máquina en un ambiente con calefacción. Si ésto no es posible, mezclar una solución 50/50 de anticongelante/agua en un depósito de 5 galones. Colocar una sección corta de manguera de jardin en el depósito y conectar a la máquina. Elevar el depósito y prender la bomba para sifonear el anticongelante a la máquina. Si se dispone de aire comprimido, puede instalarse un accesorio de aire al conector de entrada y todo el agua será evacuada fuera del sistema.

## Termostato de Control de Agua Caliente:

Para seguridad, cada unidad está equipada con un interruptor de control de temperatura. Si la temperatura del agua excede la temperatura de operación, el control apagará el quemador hasta que el agua se enfríe.

## Bombas:

Usar solamente aceite no-detergente SAE 20/30. Cambiar el aceite después de las primeras 50 horas de uso. Luego, cambiar el aceite cada tres meses o en intervalos de 500 horas. El nivel de aceite debe ser revisado usando la varilla de medir ubicada en la bomba o el punto rojo visible a través de la ventana del calibrador. El aceite debe mantenerse en ése nivel.

## Limpieza de Serpentines:

En áreas de agua alcalina, los depósitos de cal pueden acumularse en los serpentines rápidamente. Estos depósitos se incrementarán con la alta temperatura generada en los serpentines. La mejor prevención para la sedimentación es usar productos de limpieza de alta calidad. En áreas donde el agua alcalina es un problema, el uso regular de Polvo eliminador de cal Landa (parte #9-028008) limpiará la cal y otros sedimentos antes que obstruyan el serpentín.

## Eliminador de cal de Serpentines:

Se recomienda un lavado periódico de los serpentines.

1. Llenar un depósito con 4 galones de agua y luego añadir 1 libra de polvo desincrustante. Mezclar completamente.
2. Retirar la varilla de la pistola y colocar la pistola en un depósito. Asegurar que el gatillo de la pistola esté en posición abierta.
3. Unir una sección corta (3-5 pies) de manguera de jardin a la máquina para sifonear la solución hacia un depósito elevado. Encender la bomba para que la solución sea bombeada a través de los serpentines de regreso al depósito. La solución deberá circular por 2-4 horas.

4. Después de hacer circular la solución, lavar todo el sistema con agua fresca. Reinstalar la varilla en la pistola.

### Remoción de Hollín del Serpentín de Calentamiento:

Durante el proceso de calentamiento pueden producirse residuos de combustible en forma de hollín entre los serpentines de calentamiento, bloquear el flujo de aire y afectar la combustión del quemador. Cuando se observe hollín, debe limpiarse después de seguir los pasos para desmontar el serpentín.

1. Retirar el ensamble del tanque destornillando los tres tornillos Tek y levantando el cabezal del tanque.
2. Retirar los dos niples de la tubería y los accesorios correspondientes.
3. Levantar el serpentín fuera de la envoltura exterior.

***PRECAUCION: El serpentín pesa casi 80 libras. Usar técnicas de levantamiento apropiadas.***

4. Limpiar, reparar y reemplazar el serpentín siguiendo los pasos anteriores pero a la inversa.

### Válvula de Alivio de Presión:

Cada unidad está equipada con una válvula de alivio de presión para descargar la presión del sistema cuando se detectan presiones de operación más altas de lo normal. Las altas presiones inusitadas provienen de algún objeto que obstruye la boquilla de rociado. Este problema se puede remediar fácilmente al retirar la obstrucción. Si la presión de operación de la unidad es normal y la válvula de alivio sigue con fugas, reparar o reemplazar la válvula.

### Capacidad del Cilindro de Gas Propano:

Una importante consideración con los sistemas de gas propano, es la capacidad del cilindro de suministro en relación a las necesidades del quemador. El quemador opera con gas propano del cilindro, el líquido del cilindro ebulle para mantener la presión del gas. Este proceso de ebullición enfría el líquido y, en una situación de demanda continua y exigente, la temperatura del líquido puede disminuir a un punto que no puede suministrar gas tan rápido como se requiere. En este caso, podría ser necesario calentar el Cilindro de Gas Propano rociando agua caliente que no exceda 120° F, sobre el cilindro frío o al colocar dos botellas de gas propano juntas para incrementar la capacidad total de vaporización. Se recomienda usar una botella de gas propano de 30 libras de capacidad en la unidad.

## USO DEL INYECTOR DE PRODUCTOS DETERGENTES

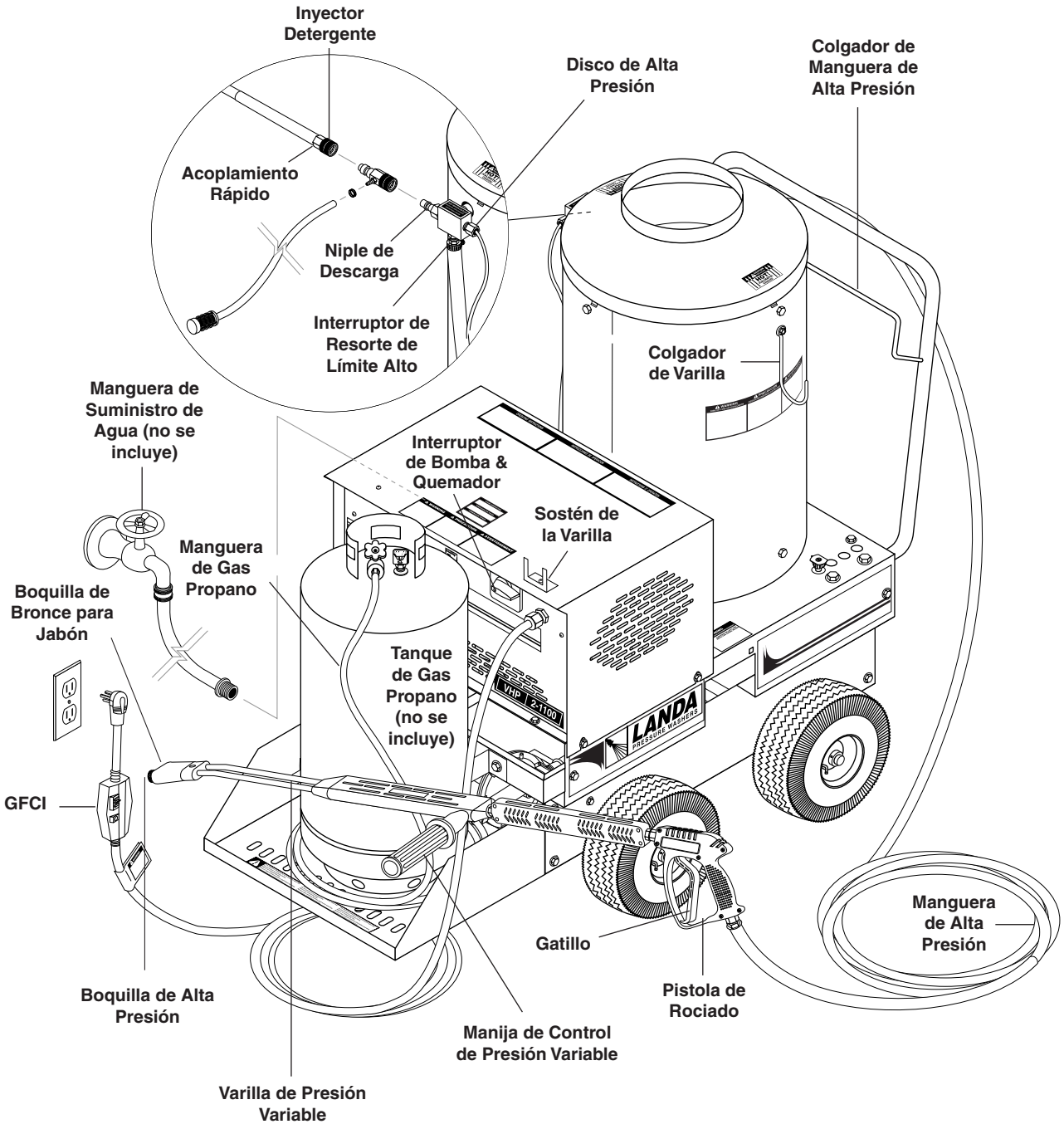
***ADVERTENCIA: Algunos productos detergentes pueden ser dañinos cuando se los inhala o ingiere, causar náuseas, desmayo o envenenamiento agudo. Los elementos dañinos pueden causar daño a la propiedad o lesiones graves.***

El conjunto de inyectores para productos detergentes de Landa se puede utilizar para hacer sifón y mezclar los detergentes.

1. Apague el motor y cierre la entrada de agua. Antes de acoplar el inyector de productos detergentes, abra la pistola de rociado para aliviar la presión.
2. Para acoplar el inyector de productos detergentes entre la unidad de lavado a presión y la manguera de alta presión, tire del cuello del acoplador de conexión rápida del inyector hacia atrás y coloque el manguito de unión de descarga. La flecha de la válvula de inyección debe apuntar en la dirección del flujo.
3. Conecte la manguera de descarga de presión al manguito de unión de inyección con el acoplador de conexión rápida. Empuje el cuello del acoplador hacia el manguito de unión.
4. Haga arrancar la unidad tal como se describe en las Instrucciones para operar la unidad.
5. Coloque el tubo de aspiración para el producto detergente en el recipiente de la solución detergente.
6. Instale la boquilla para detergente en el acople rápido.
7. Abra la pistola a gatillo. La proporción de agua y del producto detergente es de aproximadamente 15 a 1.
8. Para limpiar, coloque el tubo para el producto detergente en un recipiente con agua limpia y siga los pasos 5 y 7 para evitar que los depósitos detergentes dañen el inyector.
9. Si la unidad cuenta con una extensión de presión variable; para limpiar, alivie la presión haciendo girar la manija para el control de presión en sentido contrario a las agujas del reloj. Esto dirige el flujo de agua a través de la boquilla de jabón y permite que el inyector del producto detergente succione el jabón. Para enjuagar con agua a alta presión, simplemente gire la manija de control en la dirección de las agujas del reloj.

   **NOTA:** El inyector para los productos detergentes no puede hacer sifón cuando la manija de control, de la extensión de presión variable, se encuentra en posición de alta presión.

# IDENTIFICACION DE COMPONENTES


Inyector Detergente
Disco de Alta Presión
Colgador de Manguera de Alta Presión
Acoplamiento Rápido
Niple de Descarga
Interruptor de Resorte de Límite Alto
Colgador de Varilla
Manguera de Suministro de Agua (no se incluye)
Interruptor de Bomba & Quemador
Sostén de la Varilla
Manguera de Gas Propano
Boquilla de Bronce para Jabón
Tanque de Gas Propano (no se incluye)
GFCI
Manguera de Alta Presión
Gatillo
Pistola de Rociado
Boquilla de Alta Presión
Manija de Control de Presión Variable
Varilla de Presión Variable

LANDA®
CLEANING SYSTEMS

## GARANTÍA DE LANDA PARA SUS PRODUCTOS EQUIPOS DE LAVADO A PRESIÓN

### QUÉ CUBRE ESTA GARANTÍA

LANDA garantiza al primer comprador que todos los equipos LANDA de lavado a presión están libres de defectos de materiales y de fabricación durante el uso normal de la unidad y durante el tiempo que se indica más abajo. Esta Garantía Limitada está sujeta a las exclusiones que se muestran a continuación. Dicha garantía entra en vigencia a partir de la fecha de la compra del equipo y se aplica únicamente a los componentes originales. Cualquier parte que se reemplace durante el período cubierto por esta garantía estará comprendida en el período de garantía restante para dicha parte.

### GARANTÍA DE SIETE AÑOS PARA LAS PARTES Y DE UN AÑO PARA LA MANO DE OBRA:

Esta garantía cubre los componentes fabricados por Landa, como por ejemplo bastidores, manijas, envoltura de bobinas, tanques con flotador, tanques para combustible, cubiertas de correas y bobinas. Los componentes internos relacionados con el aceite de las bombas marca bombas propietarias tienen una garantía de 7 años. Las bombas con la marca General, AR, Liberty, Comet y los bombas que “swash” o “wobble-plate” tienen una garantía de un año.

### GARANTÍA DE UN AÑO PARA LAS PARTES Y DE UN AÑO PARA LA MANO DE OBRA:

El resto de los componentes, sin incluir el desgaste normal de los artículos que se describen abajo, estará cubierto por el período que especifique su fabricante original, con un año. La garantía para la mano de obra que se aplica a estas partes será de un año, sin perjuicio de la duración de la garantía del fabricante del componente original.

### GARANTÍA SUMINISTRADA POR OTROS FABRICANTES:

Los motores, generadores y máquinas están cubiertos por la garantía de sus fabricantes. Los centros de servicios locales autorizados por sus fabricantes prestan el servicio de mantenimiento y reparación de dichas unidades. LANDA no puede proporcionar garantía alguna para estos artículos.

### ESTA GARANTÍA NO CUBRE:

Esta garantía no cubre los siguientes artículos:

1. Artículos que tienen un desgaste normal, como ser boquillas, pistolas, mangueras de descarga, extensiónes, acopladores de conexión rápida, sellos, filtros, juntas, anillos en “O”, empaquetados, pistones, montaje de válvulas, filtros de malla, correas, cepillos, etc.
2. Daño o malfuncionamiento debido a accidentes, abuso, modificaciones, alteraciones, instalación inapropiada, servicio inapropiado, incumplimiento de las instrucciones de mantenimiento del fabricante o uso del equipo con otros fines que no se adhieran a las especificaciones contenidas en el Manual del Operador.
3. Daño a causa de heladas, deterioro debido a productos químicos, acumulación de escamas, oxidación, corrosión o expansión térmica.
4. Daño a los componentes debido a fluctuaciones en el suministro eléctrico o ala fuente de agua.
5. Servicio de mantenimiento normal, incluso los ajustes, limpieza del sistema de combustible y de obstrucciones.
6. Transporte al centro de servicios, cargos por mano de obra en planta o daño ocurrido durante el flete.

### QUÉ DEBE HACER PARA OBTENER EL SERVICIO DE LA GARANTÍA

A pesar de no ser necesario para el servicio de garantía, le solicitamos que registre su unidad para el lavado a presión. Para ello, llene la tarjeta de registro y envíela a vuelta de correo. Para obtener el servicio de LANDA de la garantía, debe hacer llegar el producto a un Distribuidor de LANDA autorizado, con flete prepago, acompañado del comprobante de la compra, dentro del período prescrito por la garantía. En caso de que el producto esté instalado de forma permanente, deberá notificar el defecto a su Distribuidor Autorizado de LANDA. El distribuidor Autorizado de LANDA presentará un reclamo a Landa la cual deberá verificar el defecto. En la mayoría de los casos, deberá enviar la parte a LANDA con flete prepago junto con el reclamo. Para el servicio de la garantía de los componentes garantizados por otros fabricantes, su Distribuidor Autorizado de LANDA le ayudará a obtener el servicio que necesite de estos fabricantes por medio de sus centros locales de servicio autorizado.

### LIMITACIÓN DE LA RESPONSABILIDAD

LANDA especificamente renuncia a la responsabilidad de todo daño y perjuicio especial, incidental, o consecuencial. La responsabilidad de LANDA con respecto a todo reclamo de cualquier índole, no superará, bajo circunstancia alguna, el precio de compra del producto en cuestión. LANDA ha puesto todo su empeño para asegurarse de que las ilustraciones y especificaciones son las que corresponden; no obstante, estas no implican la garantía de comerciabilidad o de aptitud para un fin en particular o que el producto sea un fiel reflejo de las ilustraciones y especificaciones. **LA GARANTÍA CONTENIDA EN LA PRESENTE REEMPLAZA A CUALQUIER OTRA GARANTÍA, SEA EXPRESA, IMPLÍCITA, INCLUSO TODA GARANTÍA IMPLÍCITADE APTITUD PARA UN FIN EN PARTICULAR.** LANDA no autoriza a terceros, incluso a los Distribuidores Autorizados de LANDA , a efectuar manifestación o promesa alguna en nombre de LANDA ni a modificar los términos, condiciones o limitaciones en modo alguno. Es responsabilidad del Comprador asegurarse de que la instalación y el uso de los productos LANDA se realice de acuerdo con los códigos locales. Bien que Landa intenta asegurarse de que sus productos cumplan con los códigos nacionales, no se responsabiliza por el procedimiento de utilización del producto ni por su instalación por parte del Comprador.

LANDA®

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